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THE

Dental Summary

EDITED BY
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COLUMBUS, OHIO

VOL. XXXV

PUBLISHED MONTHLY BY
THE RANSOM & RANDOLPH CO.
TOLEDO, OHIO

Index to the Dental Summary

VOLUME XXXV

1915

TITLE INDEX

		Page
Accessories, Soldering Block and	R. M. Weber	735
Accurate, Rapid and Easy Laboratory Methods	I. J. Dresch	372–445
Acetylene Flame, Par Excellence in Laboratory	W. F. Wilson	931
Acute Parenchymatous Glossitis	Virgil Loeb	668
Adenoid Pathology, Tonsil and	William F. Clevenger	827
ADDRESSES, Presidential:		
Michigan State	William A. Giffen	233
Kentucky State	W. M. Randall	236
Michigan State	Charles A. Burbridge	453
West Virginia State	W. H. Caldwell	673
Ohio State	J. K. Douglas	922
Western Pennsylvania	A. W. McCullough	1004
Alveolar Abscess and Infected Root Canals, Bacteriology of	Thomas L. Gilmer	17
AMALGAM:		
Evolution and Revelation of, Exerpts from Histo-Genesis	J. L. Mewborn	394
Modern, Possibilities of	Herbert Locke Wheeler	559
Amalgam Filling, Standardizing the	Walter G. Crandall	565–643
Combination Filling of Cement and Amalgam	George B. Smith	932
Amœba, The	Eugene S. Talbot	519
ANALGESIA:		
	Wesley M. Backus	58
	Henry J. Feltus	402
	G. W. Tainter	493
Anatomical Occlusion	J. H. Prothero	227
ANESTHESIA: Conductive, Technic of	Theodore Blum	95
Conductive	Carl D. Lucas	580
Conductive and Infiltration	F. A. Wildason	168
Local, Modern Methods of Producing	Hermann Prinz	526
Conductive	George T. Gregg	988
An Explanation	Hon. W. F. Garver	690
An Interesting Survey	L. P. Bethel	603
Announcements, Society		90–177–260–340–427–514–605–689–774–859–943–1019
Antrum of Highmore, The	T. F. Driskill	799
Appliance for Treatment of Rigg's Disease	W. T. Davis	680
Area of Injection, Sterilizing the	N. L. Burke	368
Artificial Root Implantation	W. E. Johnston	20
Artificial Teeth—Staining; Pressing Back Gum Tissue	F. A. Hamilton	158
Ascher's New Enamel	Charles M. Baldwin	53
Ten Years With	C. E. Duck	139
The Silicate Cement	F. W. Sorrels	225
A Step in Advance	L. P. Bethel	504

INDEX VOLUME XXXV—(*Continued*)

		Page
Bacteriology of Alveolar Abscess and Infected Root Canals	Thomas L. Gilmer	17
Better Dentists Wanted	Frederic R. Henshaw	994
Blood Pressure in Dentistry	E. I. McKesson	629
Bookcase by Your Desk	L. P. Bethel	776
BRIDGE WORK:		
Removable Anchored Dentures	Karl G. Knoche	126
Removable Attachment	E. Ballard Lodge	263
Importance of Principles and Requirements of	Alden Bush	666
BUSINESS-Saving Side of Dentistry	A. F. Linscott	306–422
Office Practice, Methods of	I. H. Harrington	154
Office Credits—How to Control Them	R. S. McVea	361
Office Practice, Up-to-Date	E. T. Barr	149
Service and Compensation	T. W. McFadden	400
The Dentist and the Industrial Commission	A. C. Minor	592
Business Side of Dentistry	W. A. Meis	975
Campaign, Oral Hygiene	Homer C. Brown	159
Canal Operations	W. H. Jackson	840
Significance of Pulp in	Elmer S. Best	861
Cancerous and Precancerous Lesions of the Mouth and Lips	W. D. Gatch	118
Care of the Deciduous Teeth	I. W. Copeland	970
Caries	W. A. Chamberlain	736
Case of Cleft Palate, A	E. H. Hubbuch	564
Cast Post for Modified Richmond Crown; Temporary Anterior Crown	E. H. Eberle	930
Caution, Just a Word of	L. P. Bethel	685
CAVITY PREPARATION—General Considerations	Thos. P. Hinman	133–304
For Gold Inlays	R. H. Volland	181
With Conductive Anesthesia	R. M. Hubbard	290
Under High Pressure Anesthesia	W. T. Jackman	703
As a Treatment for Caries	Edgar D. Coolidge	385
Cement for Mending Plaster Casts	W. Buzzell	458
Cement and Amalgam Combination Fillings	George B. Smith	932
Cement—Silicate; Ascher's New Enamel		53–139–225
Chronic Maxillary Empyema—Remote Effects as Applied to Dentistry	E. D. Robbins	392
Cleft Palate, A Case of	E. H. Hubbuch	564
Colorado Springs School Dental Infirmary	B. Frank Gray	411
Combination Filling of Cement and Amalgam	George B. Smith	932
Combination Gold and Porcelain Inlay	R. Ottolengui	58
Commission, Industrial, of Ohio, and The Dentist	A. C. Minor	592
Compensation and Service	T. W. McFadden	400
Conductive Anesthesia	Carl D. Lucas	580
And Infiltration Anesthesia	F. A. Wildason	168
Technic For	Theodore Blum	95
Modern Methods	Hermann Prinz	526
Conductive Anesthesia	George T. Gregg	988
Conservatism vs. Radicalism	C. C. Curtis	873
Contribution to the "Tooth in Relation to Forensic Medicine"	Hermann Prinz	309
County Training Schools—Thorough Course in Hygiene for	Frank W. Miller	771
Credit, A Matter of	L. P. Bethel	255
CROWN AND BRIDGE WORK: A Few Ideas in	W. E. Goepper	602
Use of Spence Metal Models in	Lewis G. Watkins	715
Natural Teeth in	Harry Parr	78
CROWN: Modified Richmond, and Temporary Anterior	E. H. Eberle	930
Seamless	Roy Archbold	926
Shell: the Day of, is Past	Joseph A. Gardner	431
Molar; Porcelain Faced	R. J. Rinehart	956
Deciduous Teeth; Treatment of; Filling Canals of	W. R. Alvord	497
Deciduous Teeth; Care of	I. W. Copeland	970
Dental Caries and Mouth Infection; Relation of Diet to	J. H. Kellogg	656–841
Dental Fund for War Sufferers		336
Dental Hygiene and Oral Prophylaxis, Report on	J. D. Locke	156

INDEX VOLUME XXXV—(*Continued*)

		Page
Dental Caries	W. A. Chamberlain	736
Cavity Preparation as a Treatment of	Edgar D. Coolidge	385
Dental College, What Constitutes a Reputable	L. P. Bethel	333
Dental Institute, Thomas W. Evans, The	L. P. Bethel	254
Dental Infirmary, Colorado Springs School	B. Frank Gray	411
Dental Laws, Some Things Needed in	J. W. Daniels	496
Dental Legislation, New	L. P. Bethel	420
Dental Lesions, Mixed Treatment in Some Forms of	Adolph Bernard	409
Dental Malposition, Our Responsibility in Neglecting and Treating	Varney E. Barnes	637
Dental Office Practice, Methods of	I. H. Harrington	154
Dental Profession and Its Relation to Public Health Questions	Homer C. Brown	418
Dental Radiography	George E. Johnson	779
Dental Science and Literature	Russell W. Bunting	61–459
Dental Service in Hospitals, Method of Obtaining	Herbert L. Wheeler	741
Dental Society, The	F. A. Keller	369
Dental Surgical Pathology	Carl D. Lucas	814
Dentist, The, and the Industrial Commission of Ohio	A. C. Minor	592
Dentist, Education of the Future	Eugene S. Talbot	810
Dentists; Old Time	L. P. Bethel	1019
DENTISTRY, Blood-Pressure in	E. I. McKesson	629
The Business Saving Side of	A. F. Linscott	306
My Experience With Bromural in	J. W. Roth	368
Practicing, Under Difficulties	L. P. Bethel	775
Prohibitive	Edwin S. Hulley	1010
DENTURES—Partial	F. Ewing Roach	203
Technic for Making Impressions and Models for	William A. Giffen	21
Detailed Procedure in Pulp Canal Operations	Elmer S. Best	155
Devitalization and Extirpation of Pulps	H. B. Holmes	49
Diagnosis and Treatment of Trifacial Neuralgia	Hugh W. MacMillan	435
Diseases of Metals	L. P. Bethel	686
Duty of the State Toward Mouth Hygiene	Woodbridge N. Ferris	163
EDITORIAL		79–169–254–255–333–335–420–422–504–603–685–686–775–776–942–1019
Education of the Future Dentist	Eugene S. Talbot	810
Education and Oral Hygiene (Report)	E. W. Ream	927
Emetin Treatment for Pyorrhea	James Vincent Sparks	848
Essential Factors in Establishing and Maintaining a High Standard of Public Health	Homer C. Brown	681
Evolution and Revelation of Amalgam	J. L. Mewborn	394
Examination of Dentists for U. S. Army		360
Extirpation of Pulps	H. B. Holmes	49
Face and Mouth; Precancerous Conditions of	John W. Means	945
Face, Osteoplastic Surgery of	W. Wayne Babcock	676
Facts in Regard to Preliminary Education	R. L. Spencer	766
Failure, Causes of	L. P. Haskell	594
Faith and Fear	Robert R. Gillis	710
File Your Protest	L. P. Bethel	942
Filling Root Canals	Max M. Eble	51
	W. C. Hessler	843
	W. R. Alvord	497
Filling; Standardizing the Amalgam	Walter G. Crandall	565–643
Four-year Course in Univ. of Minnesota		1022
Fracture of the Inferior Maxilla	Henry S. Dunning	347
Fracture of the Mandible	J. P. Wahl	285
Future Dentist, Education of the	Eugene S. Talbot	810
GOLD INLAY and Porcelain Restoration	C. C. Cohee	45
And Porcelain Combination	R. Ottolengui	58
A New Idea for Making	F. R. Wilder	132
Some Special Features of	Clem Shidler	219
Indirect Method	J. S. McCurdy	921
Gold and Synthetic Cement Inlay Restoration	S. F. Jacobi	959

INDEX VOLUME XXXV—(*Continued*)

		Page
Gold, Use of Soft	F. R. Henshaw	245
Gutta Percha Points, A Permanent Root Canal Filling Without	H. L. Mead	138
General Considerations of Cavity Preparation	Thomas P. Hinman	133
HEALTH—High Standard of, Essential Factors in Establishing and Maintaining	Homer C. Brown	681
Mouth Conditions and Their Relations to Public	Victor C. Vaughn	246
The Mouth and	George E. Hunt	325
Oral Prophylaxis, the Guardian of	Jules J. Sarrazin	317
Healthy Citizenship, the State's Best Asset	James M. Cox	850
Higher Professional Standards	G. L. Powers	291
High Pressure Anesthesia for Cavity Preparation	W. T. Jackman	703
Higher Qualifications for Medical and Dental Graduates	W. O. Thompson	933
Highmore, The Antrum of	T. F. Driskill	799
Human Teeth, Nature's Handiwork in	L. P. Haskell	71
HYGIENE—Oral	William W. Belcher	598
Mouth, in Public Schools; Attitude of Educational Boards Toward	Chas. F. Chadsey	250
For County Training Schools; Thorough Course in	F. W. Miller	771
Ideal Anesthetic, Novocain the	J. Crimen Zeidler	315
Idealism	Earl G. Jones	220
Illustrated Surgical Clinic	C. H. Oakman	72
"I'm From Missouri; You'll Have to Show Me"	L. West	77
Impacted Supernumeraries	H. T. Nichols	125
Implantation of Artificial Root	W. E. Johnston	20
Importance of the Principles of Bridge Work	Alden Bush	666
Impressions and Models for Dentures; Technic for Making	William A. Giffen	21
Impressions of Modelling Compound and Plaster	T. D. Dow	978
Indirect and Semi-indirect Method for Inlay Impressions	N. W. Hiatt	913
Indirect Method for Gold Inlays	J. S. McCurdy	921
Industrial Commission of Ohio; The Dentist and the	A. C. Minor	592
Infection About Roots, Foci of	J. P. Buckley	210
Inferior Maxilla, Fractures of the	Henry S. Dunning	347
Infiltration and Conductive Anesthesia	F. A. Wildason	168
Injection, Sterilizing the Area of	N. L. Burke	368
Inlays, Mounting	George Bell	158
Inlays, Cavity Preparation for	R. H. Volland	181
Inlays, Gold and Synthetic Cement Restoration	S. F. Jacobi	959
Inlay, Gold, Some Special Features of, in Molar Cavity	Clem Shidler	219
Interproximal Spaces, The	E. P. Dameron	116
Investing Wax Patterns, Technic of	R. L. Girardot	492
Jaw, Mesothelial Tumor of	Robert H. Ivy	749
Jaw, Problem of the Flat Lower	L. P. Haskell	684
Just a Word of Caution	L. P. Bethel	685
Laboratory Heat, the Acetylene Flame, Ideal for	W. F. Wilson	931
Laboratory Methods, Rapid, Accurate and Easy	I. J. Dresch	372–445
Legislation the Result of Organization		508
"Legitimate Practice of His Profession"	L. P. Bethel	335
Literature, Dental Science and	Russell W. Bunting	459
LOCAL ANESTHESIA: Conductive; Technic of	Theodore Blum	95
Conductive	Carl D. Lucas	580
Conductive and Infiltration	F. A. Wildason	168
Modern Methods of Producing	Hermann Prinz	526
Malocclusion, Prevention of	B. Frank Gray	406
Mandible, Fracture of the	J. P. Wahl	285
Marginal Ridge, Restoration of	R. L. Canine	249
Matter of Credit, A	L. P. Bethel	255
Maxilla Empyema, Chronic; Its Remote Effects Applied to Dentistry	E. D. Robbins	392
Medical and Dental Graduates; Higher Qualifications for	W. O. Thompson	933

Page
Memorial, The Miller . . . L. P. Bethel . . . 422
Mending Plaster Casts, Cement for . . . W. Buzzell . . . 458
Mesothelial Tumors of the Jaw . . . Robert H. Ivy . . . 749
Metals, Diseases of . . . L. P. Bethel . . . 686
Methods of an Up-to-date Office Practice . . . E. T. Barr . . . 149
Methods of Office Practice . . . I. H. Harrington . . . 154
Method of Obtaining Dental Service in Hospitals . . . Herbert L. Wheeler . . . 741
Method of Separating and Regaining Space . . . Lewis G. Watkins . . . 760

MISCELLANEOUS:
  Resolutions—George Edwin Hunt . . . 89
  Book Reviews—New Publications . . . 173–505–940
  Examination of Dentists for U. S. Army . . . 260
  Dental Fund for War Sufferers . . . 336
  J. N. Crouse and the Dental Protective Association . . . 337
  Report of Ohio State Board . . . 424
  Legislation the Result of Organization . . . 508
  New Dental Law for Ohio . . . 509
  An Explanation . . . 690
  Four-year Course in Univ. of Minnesota . . . 1022
Mixed Treatment in Some Forms of Dental Lesions . . . Adolph Bernard . . . 409
Modelling Compound-Plaster Impressions . . . T. D. Dow . . . 978
Modern Amalgams, The Possibilities of . . . Herbert L. Wheeler . . . 559
Modern Methods of Producing Local Anesthesia . . . Hermann Prinz . . . 526
Molar, Cavity in; Special Features of M. O. D. Gold Inlay . . . Clem Shidler . . . 219
Molar; Porcelain Faced . . . R. J. Rinehart . . . 956
Mounting Inlays . . . George Bell . . . 158
Mouth and Health, The . . . George Edwin Hunt . . . 325
Mouth; Repairing Pin Facing in . . . E. P. Marcilliat . . . 115
Mouth and Lips; Cancerous and Precancerous Lesions in . . . W. D. Gatch . . . 118
Mouth Conditions and Their Relation to Public Health . . . Victor C. Vaughn . . . 246

MOUTH HYGIENE—In the New York Public Schools . . . W. A. White . . . 161
  Duty of the State Toward . . . Woodbridge N. Ferris . . 163
  In the Public Schools; Attitude of Education Toward . . . Charles F. Chadsey . . . 250
  In Preventive Medicine; Status of . . . W. H. Price . . . 253
  What Detroit is Doing in . . . C. H. Oakman . . . 329

MOUTH INFECTION—As a Source of Systemic Disease . . . C. H. Mayo . . . 1
  . . . E. C. Rosenow . . . 4
  . . . Frank Billings . . . 6
  Relation of the Dentist to the Results of . . . Frederick B. Kramer . . 268
  The Relation of, to Systemic Disease . . . Martin H. Fischer . 607–716
  Relation of Diet to Dental Caries and . . . J. H. Kellogg . . . 656–841
Municipal Dispensaries; Specialized Technic and Advanced Service for . . . P. B. McCullough . . . 914

Nature's Handiwork in Human Teeth . . . L. P. Haskell . . . 71
Natural Teeth in Crown and Bridge Work . . . Harry Parr . . . 78
Neglecting and Treating Dental Malposition; Our Responsibility in . . . Varney E. Barnes . . . 637
Nervous Diseases; Peridental Infection as a Causative Factor in . . . C. Burns Craig . . . 8
Neuralgia, Trifacial; Diagnosis and Treatment of . . . Hugh W. MacMillan . . 435
New Dental Law for Ohio . . . 509
New Dental Legislation . . . L. P. Bethel . . . 420
New Idea in Making Gold Inlays . . . F. R. Wilder . . . 132
New Professionalism, The . . . Weston A. Price . . . 498
New Publications . . . 173–505–940
New Treatment for Pyorrhea Alveolaris . . . James Vincent Sparks . 279
Novocain; The Ideal Anesthetic . . . J. Crimen Zeidler . . . 315

OBITUARY
  Chauncey Scott Bigelow . . . 81
  William Ernest Walker . . . 86
  Charles Richard Butler . . . 87
    Resolutions . . . 175
    In Memory of Doctor Butler . . . H. L. Ambler . . . 256

OBITUARY—*(Continued)* Page
  Ezra Sprague Holmes ... 88
  R. E. Flory ... 176
  William Alfred Wilde ... 176
  G. B. F. Monk ... 176
  N. E. Hooper ... 258
  Alfred E. Griffin ... 258
  S. M. Cummins ... 259
  Ralph E. Luther ... 339
  Oliver W. Nisley—In Memoriam ... 345
  Frank Ritter ... 423
  Samuel Smith Nones ... 688
  Green Vardiman Black ... 853
  Francis Marion Burkett ... 858

OCCLUSION ... J. Lowe Young ... 186
  Anatomical ... J. H. Prothero ... 227
Office Clinic ... C. J. Lyons, C. D. Lucas ... 219
Office Credits and How to Control Them ... Robert S. McVea ... 361
Office Practice; Up-to-Date Methods in ... Thomas P. Hinman ... 140
  ... Gordon L. Burke ... 144
Ohio State Board; Report of ... 424
Ohio State Dental Society; Recent Meeting of ... L. P. Bethel ... 79
Ohio State Dental Society ... L. P. Bethel ... 942
Old Time Dentists ... L. P. Bethel ... 1019
Operations; Pulp Canal ... W. H. Jackson ... 840
Osteoplastic Surgery of the Face ... W. Wayne Babcock ... 676
Oral Hygiene ... William H. Belcher ... 598
  Campaign ... Homer C. Brown ... 159
  And the Public Health ... L. P. Bethel ... 169
  Education and; Report on ... E. W. Ream ... 927
Oral Prophylaxis; the Guardian of Health ... Jules J. Sarrazin ... 317
Our Responsibility in Neglecting and Treating Dental Malposition ... Varney E. Barnes ... 637

Palate, Cleft; A Case of ... E. H. Hubbuch ... 564
Parenchymatous Glossitis; Acute ... Virgil Loeb ... 668
Partial Dentures ... F. Ewing Roach ... 203
Pathology—Dental Surgical ... Carl D. Lucas ... 814
Pathological and Physiological, The, in Root Canal Filling ... P. A. Gould ... 905
Peridental Infection as a Causative Factor in Nervous Diseases ... C. Burns Craig ... 8
Permanent Root Canal Filling Without Gutta Percha Points ... H. L. Mead ... 138
Physician, Relation of Dentist to the ... A. C. Musgrave ... 484
Plaster Casts; Cement for Mending ... W. Buzzell ... 458
Porcelain Faced Molar Crown ... R. J. Rinehart ... 956
Porcelain, Synthetic; the Use of ... F. J. Prow ... 849
Possibilities of Modern Amalgams ... Herbert Locke Wheeler 559
Practicing Under Difficulties ... L. P. Bethel ... 775
Practical Suggestion, A ... Charles Lane ... 474
Practical Suggestions ... L. W. Daily ... 174
Precancerous Conditions of the Face and Mouth ... John W. Means ... 945
Preliminary Education; Few Facts in Regard to ... R. L. Spencer ... 766
Preparations for the Reception and Treatment of Patients ... Gillette Hayden ... 38

PRESIDENTIAL ADDRESSES:
  William A. Giffen—Michigan State ... 233
  W. M. Randall—Kentucky State ... 236
  Charles A. Burbridge—Michigan State ... 453
  W. H. Caldwell—West Virginia State ... 673
  J. K. Douglas—Ohio State ... 922
  A. W. McCullough—Western Pennsylvania ... 1004
Prevention of Malocclusion ... B. Frank Gray ... 406
Prevention and Reproduction ... William Conrad ... 979
Principles of Vaccine Therapy ... Bailey Harris ... 786
Professional Standards, Higher ... G. L. Powers ... 291
Profession; Legitimate Practice of ... L. P. Bethel ... 335
Professionalism, The New ... Weston A. Price ... 498
Prohibitive Dentistry ... Edwin S. Hulley ... 1010

Page

Public Health; Essential Factors in Establishing and Maintaining .... Homer C. Brown 681
  Oral Hygiene and .... L. P. Bethel 169
Public Health Questions; The Status of the Dental Profession and Its Relation to .... Homer C. Brown 418
Pulp Canal Operations .... W. H. Jackson 840
  Detailed Procedure in .... Elmer S. Best 155
  Significance of .... Elmer S. Best 861
Pulp Treatment and Filling of Root Canals .... Thomas P. Hinman 378
Putrescent Pulps and Filling of Root Canals .... H. B. Tileston 46
Pyorrhea; Uric Acid and Its Relation to .... J. L. Mewborn 297
Pyorrhea .... E. B. Hosom 224
Pyorrhea Alveolaris; A New Treatment for .... James Vincent Sparks . 279
  Removal of Deposits .... Thomas P. Hinman 591
  Splint for .... A. Reitz 78
  The Emetin Treatment for .... James Vincent Sparks . 848
Recognition of Diseases of Soft Tissues and Foci of Infection About Roots .... J. P. Buckley 210
Relation of the Dentist to the Results of Mouth Infection .... Frederick B. Kremer 268
Relation of the Dentist to the Physician .... A. C. Musgrave 484
Relation of Mouth Infection to Systemic Diseases .... Martin H. Fischer . 607–716
Relation of Diet to Dental Caries and Mouth Infection .... J. H. Kellogg 656–841
Removal of Pyorrhea Deposits .... Thomas P. Hinman 591
Removable Bridge Work and Anchored Dentures .... Karl G. Knoche 126
Removable Bridge Attachment .... E. Ballard Lodge 263
Repairing Broken Pin Facing in the Mouth .... E. P. Marcilliat 115
Report—Oral Hygiene .... G. C. Bowles 586
Report—Dental Hygiene and Oral Prophylaxis .... J. D. Locke 156
Report—Committee on Dental Science and Literature 242
Report—Ohio State Board 424
Reproduction; Prevention and .... William Conrad 979
Restoration—Silicate Cement .... I. H. Harrington 267
  Gold Inlay and Synthetic Porcelain .... C. C. Cohee 45
  Of Marginal Ridge .... R. L. Canine 249
Rigg's Disease—Appliance for Treatment of .... W. T. Davis 680
Root Canals, Filling .... Max M. Eble 51
Root Canal Filling .... W. C. Hessler 843
Root Canal Filling; The Pathological and Physiological in .... P. A. Gould 905
Root Canals—Pulp Treatment and Filling of .... Thomas P. Hinman 378
Root Treatment .... Thomas P. Hinman 466

Save or not to Save, To .... James F. Hannon 452
Science and Literature, Dental, Report on .... Russell W. Bunting 61
Science Reveals, What .... H. E. Bliler 901
Seamless Crown .... Roy Archbold 926
Separating and Regaining Space; Method of .... Lewis G. Watkins 760
Service and Compensation .... T. W. McFadden 400
Shell Crowns, The Day of, is Past .... Joseph A. Gardner 431
Short-Cuts to Success, and the Penalties .... Edgar A. Honey 691
Significance of the Pulp Canal Operation .... Elmer S. Best 861
Silicate Cements; Ascher's New Enamel .... F. W. Sorrells 225
Silicate Cement Restoration .... I. H. Harrington 267

SOCIETY ANNOUNCEMENTS . . 90 170 260–340–427–514–605–689–774–859–943–1020
Soldering Block and Accessories .... R. M. Weber 735
Some Things Needed in Our Dental Laws .... J. W. Daniels 496
Spaces, The Interproximal .... E. P. Dameron 116
Specialized Technic and Advanced Service for Municipal Dispensaries .... P. B. McCullough 914
Spence Metal Models in Crown and Bridge Work .... Lewis G. Watkins 715
Splint for Pyorrhea .... A. Reitz 78
Staining Artificial Teeth .... F. A. Hamilton 158
Standards and Records; The Value of .... Chas. M. Baldwin 443
Standardizing the Amalgam Filling .... Walter G. Crandall 565–643
Status of Mouth Hygiene in Preventive Medicine .... W. H. Price 253
Status of the Dental Profession and Its Relation to Public Health Questions .... Homer C. Brown 418
State's Best Asset; A Healthy Citizenship .... James M. Cox 850

INDEX VOLUME XXXV—(*Continued*)

		Page
Sterilizing the Area of Injection	N. L. Burke	368
Stomatology, Field of; Its Needs, Duties and Opportunities	William C. Fisher	470
Stomatology as a Factor in the Evolution of Medical and Dental Science	George V. I. Brown	475
Suggestions, Practical	L. W. Daily	174
	Charles Lane	474
Supernumeraries, Impacted	H. T. Nichols	125
Surgery, Osteoplastic, of the Face	W. Wayne Babcock	676
Surgical Pathology, Dental	Carl D. Lucas	814
Survey, An Interesting	L. P. Bethel	603
Synthetic Porcelain; The Use of	F. J. Prow	849
Systemic Disease: Mouth Infection as Source of	C. H. Mayo	1
	E. C. Rosenow	4
	Frank Billings	6
Relation of Mouth Infection to	Martin H. Fischer	607–716
Tantalum and Its Uses	Charles M. Baldwin	595
Technic of Conductive Anesthesia	Theodore Blum	95
Technic of Investing Wax Pattern	R. L. Girardot	492
Technic for Making Impressions and Models for Dentures	William A. Giffen	21
Teeth, Staining Artificial; and Pressing Back Tissue from Broken-down Teeth	F. A. Hamilton	158
Temporary Anterior Crown; Modified Richmond Crown	E. H. Eberle	930
Ten Years With Ascher's Enamel	C. E. Duck	139
Therapy, Vaccine; Principles of	Bailey Harris	786
Thomas W. Evans Museum and Institute	L. P. Bethel	254
Thorough Course in Hygiene for County Training Schools	F. W. Miller	771
To Save or Not to Save	James F. Hannon	452
Tonsil and Adenoid Pathology	William F. Clevenger	827
Tooth, The, In Its Relation to Forensic Medicine	Hermann Prinz	309
Treating Dental Malposition; Our Responsibility in	Varney E. Barnes	637
Treatment—Root	Thomas P. Hinman	466
Vaccine	C. P. Emerson	413
Of Putrescent Pulps and Filling Root Canals	H. B. Tileston	46
Of Rigg's Disease; Appliance for	W. T. Davis	680
Emetin, The, for Pyorrhea	James Vincent Sparks	848
Trifacial Neuralgia; Diagnosis and Treatment of	H. W. MacMillan	435
Tumor, Mesothelial, of Jaw	Robert H. Ivy	749
Up-to-Date Methods of Office Practice	Thomas P. Hinman	140
	Gordon L. Burke	144
	E. T. Barr	149
Uric Acid and Its Relation to Pyorrhea	J. L. Mewborn	297
Uric Acid; A Supplement to Last Year's Paper	J. L. Mewborn	623
Use of Soft Gold	Frederic R. Henshaw	245
Use of Natural Teeth in Crown and Bridge Work	Harry Parr	78
Use of Synthetic Porcelain, The	F. J. Prow	849
Vaccine Treatment	C. P. Emerson	413
Vaccine Therapy; Principles of	Bailey Harris	786
Value of Standards and Records	Charles M. Baldwin	443
Wanted—Better Dentists	Frederic R. Henshaw	994
Wax Patterns; Technic of Investing	R. L. Girardot	492
What Constitutes a Reputable Dental College	L. P. Bethel	333
What Science Reveals	H. E. Bliler	901
What Detroit Is Doing in Mouth Hygiene	C. H. Oakman	329
Why They Failed	L. P. Haskell	594
Zonetherapy	Wm. H. Fitzgerald	364

AUTHORS' INDEX

		Page
Alvord, W. R.	Filling Root Canals and Treatment of Deciduous Teeth	497
Ambler, H. L.	In Memory of Doctor Butler	256
Archbold, Roy	Seamless Crowns	926
Babcock, W. Wayne	Osteoplastic Surgery of the Face	676
Backus, Wesley M.	Analgesia	58
Baldwin, C. M.	Ascher's New Enamel	53
	The Value of Standards and Records	443
	Tantalum and Its Uses	595
Barnes, Varney E.	Our Responsibility in Neglecting and Treating Dental Malposition	637
Barr, E. T.	Methods of an Up-to-Date Office Practice	149
Belcher, Wm. W.	Oral Hygiene	598
Bell, George	Mounting Inlays	158
Bernard, Adolph	Mixed Treatments in Some Forms of Dental Lesions	409
Best, Elmer S.	Detailed Procedure in Pulp Canal Operations	155
	The Significance of the Pulp Canal Operation	861
Bethel, L. P.	Recent Meeting of the Ohio State Dental Society	79
	Oral Hygiene and the Public Health	169
	The Thomas W. Evans Museum and Dental Institute	254
	A Matter of Credit	255
	What Constitutes a Reputable Dental College	333
	Legitimate Practice of His Profession	335
	New Dental Legislation	420
	The Miller Memorial	422
	A Step in Advance	504
	An Interesting Survey	603
	Just a Word of Caution	685
	Disease of Metals	686
	Practicing Dentistry Under Difficulties	775
	The Bookcase by Your Desk	776
	Ohio State Dental Society	942
	File Your Protest	942
	Old Time Dentists	1019
Billings, Frank	Mouth Infection as Source of Systemic Disease	6
Bliler, H. E.	What Science Reveals	901
Blum, Theodore	A Technic of Conductive Anesthesia	95
Bowles, G. C.	Oral Hygiene Report	586
Brown, Geo. V. I.	The Section on Stomatology as a Factor in the Evolution of Dental and Medical Science	475
Brown, Homer C.	Oral Hygiene Campaign	159
	The Status of the Dental Profession and Its Relation to Public Health Questions	418
	Essential Factors in Establishing and Maintaining a High Standard of Public Health	681
Buckley, J. P.	Recognition of Diseases of the Soft Tissues and of Foci of Infection About Roots	210
Burbridge, Chas. A.	President's Address	453
Burke, Gordon L.	Up-to-Date Methods of Office Practice	144
Burke, N. L.	Sterilizing the Area of Injection	368
Bunting, Russell W.	Dental Science and Literature	61
	Dental Science and Literature	459
Bush, Alden	Some Conclusions Regarding the Importance of the Principles and Requirements of Bridge Work	666
Buzzell, W.	Cement for Mending Plaster Casts	458
Caldwell, W. H.	President's Address	673
Canine, R. L.	Restoration of Marginal Ridge	249
Chadsey, Charles F.	The Attitude of Education Toward Mouth Hygiene in the Public Schools	250
Chamberlain, W. A.	Dental Caries	736
Clevenger, William F.	Tonsil and Adenoid Pathology	827
Cohee, C. C.	Restoration by Gold Inlay and Synthetic Porcelain	45

		Page
Conrad, William	Prevention and Reproduction	979
Coolidge, Edgar D.	Cavity Preparation as a Treatment of Dental Caries	385
Copeland, I. W.	The Care of the Deciduous Teeth	970
Cox, James M.	A Healthy Citizenship, the State's Best Asset	850
Craig, C. Burns	Peridental Infection as a Causative Factor in Nervous Diseases	8
Crandall, Walter G.	Standardizing the Amalgam Filling	565–643
Curtiss, C. C.	Conservatism vs. Radicalism	873
Dailey, L. W.	Practical Suggestions	174
Dameron, E. P.	The Interproximal Spaces	116
Daniels, J. W.	Some Things Needed in Our Dental Laws	496
Davis, W. T.	Appliance for the Treatment of Rigg's Disease	680
Dresch, I. J.	Accurate, Rapid and Easy Laboratory Methods	372–445
Driskill, T. F.	The Antrum of Highmore	799
Douglas, J. K.	President's Address	922
Dow, T. D.	Modelling Compound-Plaster Impressions	978
Duck, C. E.	Ten Years With Ascher's Enamel	139
Dunning, Henry S.	Fractures of the Inferior Maxilla	347
Eberle, E. H.	A Cast Post Modified Richmond Crown and a Temporary Anterior Crown	930
Eble, Max M.	Filling Root Canals	51
Emerson, C. P.	Vaccine Treatment	413
Feltus, Henry J.	Analgesia	402
Ferris, Woodbridge N.	The Duty of the State Toward Mouth Hygiene	163
Fischer, Martin H.	The Relation of Mouth Infection to Systemic Disease	607–716
Fisher, William C.	I The Section on Stomatology; Its Needs, Its Duties and Its Opportunities	
	II The Field of Stomatology	470
Fitzgerald, Wm. H.	Zonetherapy	364
Gardner, Joseph A.	The Day of the Shell Crown is Past	431
Gatch, W. D.	Cancerous and Precancerous Lesions of the Mouth and Lips	118
Giffen, William A.	Technic for Making Impressions and Models for Dentures	21
	President's Address	233
Gillis, Robert R.	Faith and Fear	710
Gilmer, Thomas L.	Bacteriology of Alveolar Abscess and Infected Root Canals	17
Girardot, R. L.	Technic of Investing Wax Patterns	492
Goepper, W. E.	A Few Ideas in Crown and Bridge Work	602
Gould, P. A.	The Pathological and Physiological in Root Canal Filling	905
Gray, B. Frank	Prevention of Malocclusion	406
Gregg, George T.	Conductive Anesthesia	988
	The Colorado Springs School Dental Infirmary	411
Hamilton, F. A.	Staining Artificial Teeth—Pressing Back Gum Tissue from Badly Broken-down Teeth	158
Hannon, James F.	To Save or Not to Save	452
Harrington, I. H.	Methods of Dental Office Practice	154
	Silicate Cement Restoration	267
Harris, Bailey	The Principles of Vaccine Therapy, etc.	786
Haskell, L. P.	Nature's Handiwork in Human Teeth	71
	The Flat Lower Jaw Problem	684
	Why They Failed	594
Hayden, Gillette	Preparation for the Reception and Treatment of Patients	38
Henshaw, F. R.	Use of Soft Gold	245
	Wanted—Better Dentists	994
Hessler, W. C.	Root Canal Filling	843
Hiatt, N. W.	Indirect and Semi-indirect Method of Inlay Impression	913
Hinman, Thomas P.	General Considerations of Cavity Preparation	133
	Up-to-Date Methods of Office Practice	140
	Cavity Preparation	304
	Pulp Treatment and Filling of Root Canals	378
	Root Treatment	466
	Removal of Pyorrhea Deposits	591

Page

Holmes, H. B. .... Devitalization and Extirpation of Pulps 94
Honey, Edgar A. .... Short-Cuts to Success and the Penalties 691
Hosom, E. B. .... Pyorrhea 224
Hubbard, R. M. .... Cavity Preparation with Conductive Anesthesia 290
Hubbuch, E. H. .... A Cleft Palate Case 564
Hulley. Edwin S. .... Prohibitive Dentistry 1010
Hunt, G. E. .... The Mouth and Health 325

Ivy, Robert H. .... Mesothelial Tumors of the Jaws 749

Jackman, W. T. .... High Pressure Anesthesia for Cavity Preparation 703
Jackson, W. H. .... Pulp Canal Operations 840
Jacobi, S. F. .... Inlays, Gold and Synthethic Cement Restoration 959
Johnson, George E. .... Dental Radiography 779
Johnston, W. E. .... Implantation of an Artificial Root 20
Jones, Earl G. .... Idealism 220

Keller, F. A. .... The Dental Society 369
Kellogg, J. H. .... Relation of Diet to Dental Caries and Mouth Infection 656–841
Knoche, Karl G. .... Removable Bridge Work and Anchored Dentures 126
Kremer, Frederick B. .... Relation of the Dentist to the Results of Mouth Infection 268
Lane, Charles .... A Practical Suggestion 474
Linscott, A. F. .... The Business Saving Side of Dentistry 306–422
Locke, J. D. .... Report on Dental Hygiene and Oral Prophylaxis 156
Lodge, E. Ballard .... A Removable Bridge Attachment 263
Loeb, Virgil .... Acute Parenchymatous Glossitis 668
Lucas, Carl D. .... Conductive Anesthesia 580
    Dental Surgical Pathology 814
    Office Clinic 219
Lyons, Chalmers J. .... Office Clinic 219

MacMillan, Hugh W. .... Diagnosis and Treatment of Trifacial Neuralgia 435
Mallett, Stephen P. .... Local Anesthesia 892
McCullough, P. B. .... Specialized Technic and Advanced Service for Municipal Dispensaries 914
McCullough, A. W. .... President's Address 1004
McCurdy, J. S. .... Indirect Method of Gold Inlays 921
McKesson, E. I. .... Blood Pressure in Dentistry 629
McFadden, T. W. .... Service and Compensation 400
McVea, Robert S. .... Office Credits and How to Control Them 361
Marcilliat, E. P. .... Repairing Broken Pin Facing in the Mouth 115
Mead, H. L. .... A Permanent Root Canal Filling Without Gutta Points 138
Mayo, C. H. .... Mouth Infection as a Source of Systemic Disease 1
Mewborn, J. L. .... Uric Acid and Its Relation to Pyorrhea 297
    Excerpts from the Histo-Genesis, Evolution and Revelation of Amalgam 394
    Uric Acid—A Supplement to Last Year's Paper 623
Means, John W. .... Precancerous Conditions of the Face and Mouth 945
Meis, W. A. .... The Business Side of Dentistry 975
Miller, Frank W. .... A Thorough Course in Hygiene for County Training Schools 771
Minor, A. C. .... The Dentist and the Industrial Commission of Ohio 592
Musgrave, A. C. .... Relation of the Dentist to Physician 484

Nichols, H. T. .... Impacted Supernumeraries 125

Oakman, C. H. .... Portion of Illustrated Surgical Clinic 72
    What Detroit is Doing in Mouth Hygiene 329
Ottolengui, R. .... Combination Gold and Porcelain Inlay 58

Parr, Harry .... The Use of Natural Teeth in Crown and Bridge Work 78
Powers, G. L. .... Higher Professional Standards 291
Price, W. H. .... The Status of Mouth Hygiene in Preventive Medicine 253
Price, Weston A. .... The New Professionalism 498
Prinz, Hermann .... A Contribution to the Tooth and Its Relation to Forensic Medicine 309
    Modern Methods of Producing Local Anesthesia 526

		Page
Prothero, J. H.	Anatomical Occlusion	227
Prow, F. J.	The Use of Synthetic Porcelain	849
Randall, W. M.	President's Address	236
Ream, E. W.	Education and Oral Hygiene Report	927
Reitz, A.	Pyorrhea Splint	78
Rinehart, R. J.	Porcelain-faced Molar Crown	956
Roach, F. Ewing	Partial Dentures	203
Robbins, E. D.	Chronic Maxilla Empyema—Its Remote Effects as Applied to Dentistry	392
Rosenow, E. C.	Mouth Infection as a Source of Systemic Disease	4
Roth, J. W.	My Experience with Bromural in Dentistry	368
Sarrazin, Jules J.	Oral Prophylaxis the Guardian of Health	317
Shidler, Clem J.	Gold Inlay, Some Special Features of M. O. D. Cavity in Molar	219
Smith, George B.	Combination Filling of Cement and Amalgam	932
Sorrels, F. W.	The Silicate Cement—Ascher's New Enamel	225
Sparks, James Vincent	A New Treatment for Pyorrhea Alveolaris	279
	The Emetin Treatment for Pyorrhea	848
Spencer, R. L.	A Few Facts in Regard to Preliminary Education	766
Tainter, G. W.	Analgesia	493
Talbot, Eugene S.	The Education of a Future Dentist	810
	The Amœba	519
Thompson, W. O.	Higher Qualifications for Medical and Dental Graduates	933
Tileston, H. B.	The Treatment of Putrescent Pulps and Filling of Root Canals	46
Vaughn, Victor C.	Mouth Conditions and Their Relation to Public Health	246
Volland, R. H.	Cavity Preparation for Gold Inlays	181
Wahl, J. P.	Fracture of the Mandible	285
Watkins, Lewis G.	Use of Spence Metal Models in Crown and Bridge Work	715
	Method of Separating and Regaining Space	760
Weber, R. M.	A Soldering Block and Accessories	735
West, L.	I'm From Missouri, You'll Have to Show Me	77
Wheeler, Herbert L.	A Method of Obtaining Dental Service in Hospitals	741
	The Possibilities of Modern Amalgams	559
Wildason, F. A.	Infiltration and Conductive Anesthesia	168
White, W. A.	Mouth Hygiene in the New York Public Schools	161
Wilder, F. R.	A New Idea for Making Gold Inlays	132
Wilson, W. F.	Acetylene Flame, the Laboratory Heat Par Excellence	931
Young, J. Lowe	Occlusion	186
Zeidler, J. C.	Novocain, the Ideal Anesthetic	315

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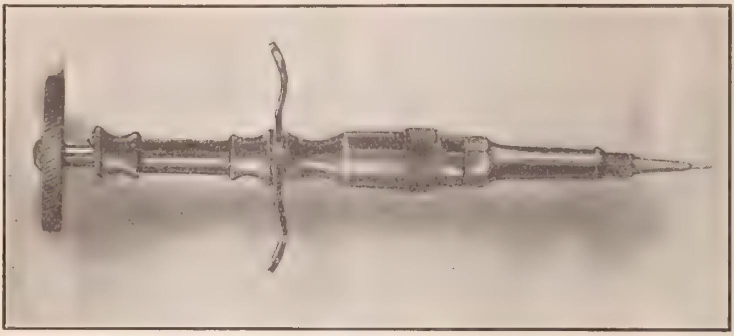

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THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV JANUARY, 1915 No. 1

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Foreign, U. P. U. Countries, $1.75. **Advertising Rates on Request**

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REGULAR CONTRIBUTIONS

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE*

BY C. H. MAYO, M.D., ROCHESTER, MINN.

IT HAS TAKEN A LONG TIME for the general public to appreciate the full role of infection in the production of death, while even in the medical profession, more has come from the study of infections in the prevention of disease than in increasing the means of cure of disease, great as have been the results of treatment.

Since all animal life depends on some other form of cell life, vegetable or animal, it seems but the part of all life to carry on this process of germinative development and maturity. It is only the resistance of healthy cells that prevents the inroads of the myriads of ever-present bacteria and animal parasites which are striving to get a foothold that they may in turn carry on their life work. Disease, then, is an inflammatory process from infection and the efforts at repair. It may also be chronic from the failure of cell life through lack of defense, from defective nutrition and advancing age.

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*Address before the Section on Stomatology, American Medical Association, of which The Dental Summary is the representative organ for the dental profession by special arrangement with the Journal American Medical Association.

We still speak more or less lightly of the so-called diseases of childhood, and the time is not far past since mothers took their children to be exposed to whooping cough, mumps, etc. Today the intelligent woman knows that it is not necessary that the vitality of the child should be jeopardized by such preventable diseases, and that when they occur it is through carelessness, neglect or ignorance on the part of some one.

A comparatively small number of infections occur through wounds of the cutaneous surface. Many of those affecting the special organs are incurred through direct or indirect contact, as those of the eye and of the genito-urinary system. They may make most serious inroads on the general health. Infections which produce the greatest number of diseases enter the system by way of the alimentary and respiratory tracts. Somewhere in the line, then, of the alimentary and respiratory tracts and in the excretory ducts of the body, lie the sources of the entrance of organisms which terminate life in the majority of instances. The great importance of the well-known diseases of the nasal passages with their sinuses, the lymphoid tissue of the pharynx, including the tonsils, and the diseases of gums and teeth, which have been given prominence by the dental profession during the last three years, is now more generally appreciated.

The mouth is the harbor of many varieties of bacteria which are constantly taken into the stomach during the process of eating. We have long looked on the acids of the stomach as destructive to such bacteria, but Smithies, in a microscopic examination of gastric extracts from 2,406 different individuals with "stomach complaint" (dyspepsia, indigestion and the like), showed that irrespective of the degree of acidity of such gastric extracts, bacteria were present in 87 per cent. Morphologically, cocci and diplococci were present in 83 per cent.; short and long rods (often of the colon group), in 58 per cent.; typical streptococci and staphylococci in 17 per cent., and *Leptothrix buccalis* in 24 per cent. In fifty-four cultural studies of saliva from "dyspeptic" patients, streptococci and staphylococci were demonstrated in over 80 per cent., bacilli in 66 per cent. and *Leptothrix buccalis* in more than 14 per cent. Comparing these figures, it would appear that the common forms of pus-producing organisms (streptococci and staphylococci) have their proliferation retarded in gastric juice, but that bacilli (often of the colon group) as well as *Leptothrix buccalis* thrive in the stomach.

Bacteria of various forms live in the small intestine, or at least pass through it or into the blood stream by way of the mucous membrane. They exist in such great numbers in the large bowel that, whether living or dead, they constitute a considerable bulk of the dejecta. During the last few years some important points have been added to our knowledge of bacteria. Living germ life in the blood, or bacteremia, occurs in all infectious diseases.

According to their number and virulence, the blood responds in slight or extreme degree to the symptoms, general and local, constituting the disease.

We have long known that bacteria were specified in type and action in all diseases in which we have been able to identify a specific germ. Rosenow has done a great work in showing that changes in environment may so change bacteria that specific action varies. The appearance of the bacteria is also unlike that of the original cell. In the blood stream these various forms, once they enter it, are selective in choosing their location, thereby developing specific local disease. The old "idiopathic" osteomyelitis of the child we now know may follow a short time after a specific tonsilitis. Pyorrhea, tonsilitis or sinus disease may be the source of an infection which we call rheumatism. Root abscesses and pus pockets connecting with them are often the source of acute and chronic rheumatism. The nasal sinuses and chronic mouth and throat infections develop anaphylaxis from the constant poisoning, and their results are shown in hay fevers, asthmas, urticarias, etc. Rosenow's work is going far to show that ulcerations of the stomach are conditions in which the mucosa is attacked from behind through the blood stream by bacteria which live in the blood and have a selective affinity for these particular areas. Septic bile which, in the majority of instances, is caused by infection, is carried to the liver through the portal circulation. It creates such changes in the bile that it fails to activate the pancreatic and duodenal secretion, thus making various phases of indigestion, with qualitative rather than quantitative food trouble. Lower down we have the appendix with its lymphoid tissue which approximates in character that of the tonsil. Here the acid types of bacteria have the same opportunity, could they but enter the blood stream, of making erosions of the gastric mucosa as the specific form which is found in the mouth. We may here note that acid-secreting or acid-bathed surfaces are very subject to cancerous change, while alkaline-bathed surfaces are much less liable to be involved. Saliva is neutral or slightly alkaline in health, yet less than 20 per cent. of people have healthy mouths. The infected mouth shows a tendency to the acid reaction and it is through this acid change that we have an additional danger in cell degeneration, of malignant type, from chronic irritation.

The stomach is the most common location of all cancers, while the alkaline small intestine is rarely subject to cancer and the duodenum is most resistant to it. The large bowel again reverts to an acid reaction and is very subject to cancer. So also is the bladder. These structures with acid secretion are of more recent development than are many tissues of animal life, several of them being classed as organs of convenience, which fact renders them possibly less resistant.

Certainly enough is known concerning infections and their mode of entrance, that the infected and diseased mouth and respiratory tract must be looked on as most serious menaces. Much may be done by more general and effective school inspection. The present generation of children will understand and demand protection for their children in time. The first teeth should be watched, that the second be not permitted to erupt irregularly, causing deformities. Jaws should be spread that the teeth may meet and the high arched palate, diminishing nasal breathing, thereby reduced. Tonsils and adenoids should be looked after, thus preventing ear and mastoid diseases, rheumatism, endocarditis, etc. In chronic and recurring diseases, a search must be made to establish positively the non-participation of each of the several sources of infection.

The physicians engaged in this line of observation require fully as much training in the rudiments of dentistry as the dentist does in the signs of infectious diseases. While we have leaders in all professions, through the energy of their kinetic glands, the big stick which leads to our advancement is in the hands of the progressive and educated public who are constantly demanding more of their dentists, of the medical profession, and of the state in protecting them against preventable diseases.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE*

BY E. C. ROSENOW, M.D., CHICAGO

CULTURES FROM EMULSIFIED TISSUES in various systemic disorders, such as the adjacent lymphatic glands draining the involved joints in arthritis deformans, in acute articular rheumatism, and the lymph-glands in Hodgkin's disease, have yielded interesting results. One striking thing in connection with some of the more chronic infections is that the character of the micro-organisms found in the lesion may be quite different from the character of the micro-organisms in the focus of infection at the same time. This, however, does not minimize the importance of the focus of infection in any way. The organisms found in the tissues may have undergone change. This fact should be borne in mind whenever autogenous vaccines are to be used. The poor results in some cases of arthritis, for example, following the use of autogenous vaccines prepared from the tonsils or other presumable focus, may be due to the fact that the organisms present in the focus at the particular time when the cultures were made were not like those actually infecting the tissues. And if so, the vaccine would fail to contain the proper antigen.

While the most common location of the focus in various infections is probably in the head, and hence the great opportunity for you, it may be located elsewhere. Thus in two cases of typical rheumatism we succeeded in isolating the *Streptococcus rheumaticus* from the stool; in one from an infected ingrowing toe-nail, and in another case from the wound in the thumb following a crushing injury.

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*Address before Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Journal American Medical Association.

The abscesses or bony changes found about the roots of teeth in various systemic diseases, especially in cases of chronic arthritis, may or may not be primary, but if found, the condition should be corrected, because vaccine or other treatment largely fails so long as there exists an active focus of infection, as shown, particularly by Billings. My study on the effect of varying degrees of oxygen tension on the members of the streptococcus group, together with other facts, makes it likely that it is in the focus of infection that changes in virulence occur and the different affinities for various structures are acquired. In other words, the focus of infection is to be looked on not only as the place of entrance of the bacteria, but also the place where the organisms acquire the peculiar property necessary to infect. In the light of our present knowledge the argument that infections in the mouth are so common in individuals in apparent health, does not minimize their importance. These or other foci are so common in patients suffering from arthritis, neuritis, appendicitis, ulcer of the stomach and cholecystitis, goiter, etc., and so rare in individuals who have had superb health for years, that their direct etiologic role can scarcely be questioned.

Regarding autogenous vaccines, our ideas need to be revised somewhat in view of the fact that the vaccines administered are usually prepared from streptococci in the focus and which may or may not be the causative organism. The instances in which good results are obtained are probably those in which the focus harbored the causative organism and the vaccine prepared from it. The instances in which poor results are obtained may be due to the fact that the vaccine does not contain the proper antigen.

With regard to the foci: What are they, where are they, and what organisms are usually present? Probably the most common location of the focus or source of infection is the mouth. The tooth socket has a structure similar to that of the joints, and a blind abscess at the apex of a tooth may have no more significance than the lesion in the joint. While it is proper to remove the teeth that are abscessed in a case of that kind, we should not expect that that is necessarily the source of the trouble, but must look still further.

In connection with acute infections, the acute arthritis that we see in rheumatism, a few cases may be of interest. In the first case the patient had gone through the search for foci of infection; his tonsils had been removed, the teeth examined, and a thorough physical examination made. The patient had had repeated attacks of rheumatism which continued for years, and usually occurred in the fall. He came to me in the midst of one of these attacks and on examination I was unable to find any focus of infection that would account for the trouble. This particular attack followed some intestinal disturbance. On three occasions I was able to isolate from the intestinal tract a streptococcus which, when injected into animals, produced rheumatism. This attack cleared up and I immunized the patient for a long time with the vaccine prepared from the streptococcus from his stool in the hope that some unknown focus in the intestinal tract might clear up.

This patient went south, and while in the south he had some trouble with his teeth. He saw a dentist and the dentist happened to be a man who knew something about the work that Dr. Moorehead and Dr. Gilmer are doing in regard to the teeth, and he found an abscessed tooth and pockets of pyorrhea. When he came back I examined the mouth carefully and found no evidence of infection until along the surface of the gums I raised the tissues and found pus pockets. There was not even inflammation on the surfaces, but with a probe I obtained pus from the pockets around the teeth, from which I made a culture and produced rheumatism in an animal. The pyorrhea probably had existed for years. This illustrates how difficult it is to locate the focus.

Another case in which the focus of infection was entirely overlooked was that of a young lad who had an acute attack of rheumatism with endocarditis and pericarditis so serious that it was thought he would die. I was asked to see the patient, with some idea, I think, of giving a vaccine. On examination I found that the boy's thumb had been crushed off in an accident ten days before the rheumatism began. I obtained from a necrotic area remaining a culture of a streptococcus like that of rheumatism, and when injected into animals it produced rheumatism readily.

It will be seen that the question of the focus of infection is a matter not only for the stomatologist or the dentist, but for the general practitioner, the surgeon; every branch of medicine needs to be taken into consideration to run the matter down and find the focus from which the organism gains entrance into the body.

MOUTH INFECTION AS A SOURCE OF SYSTEMIC DISEASE*

BY FRANK BILLINGS, M.D., CHICAGO

THE SUBJECT ASSIGNED is "Mouth Infection as a Source of Systemic Disease." I shall confine my remarks to infection of the jaws (alveolar infection), as related to systemic disease. Many radiographic films of the jaws have been made from patients in our clinic at Rush Medical College and the Presbyterian Hospital, suffering from chronic arthritis. One film shows an alveolar abscess occurring in a patient with Hodgkin's disease. These films as a means of recognition of alveolar infection are not new to members of this section, but this method of examination of alveolar disease is not sufficiently utilized by dentists and physicians generally. It should be used, for by no other method may one know the exact condition of the alveoli and roots of the teeth. Alveolar infection and abscesses may be primary and due to unhygienic conditions of the mouth, and I am sure it is often intensified and prolonged by irrational dentistry—teeth with infected pulp crowned or improperly filled. General mal-nutrition (scurvy, etc.) may cause mouth infection and alveolar disease. But whether primary or secondary, alveolar focal infection may be the dominant factor in the production of systemic disease, of which malignant endocarditis (*Streptococcus viridans*), chronic arthritis and myositis are examples. From the infected alveoli and tooth canals we have made bacterial cultures. The dominant organisms belong to the streptococcus-pneumococcus group. I would refer you to the brilliant results of the investigation of our colaborer, Dr. E. C. Rosenow, on the mutation of cultural and pathogenic characteristics of this group of bacteria. In addition staphylococci, a fusiform bacillus, the *Bacillus aerogenes capsulatus*, and various saprophytic organisms are found. The streptococcus-pneumococcus group apparently comprise the important pathogenic bacteria related to systemic disease. In five patients suffering from Hodgkin's disease, an alveolar abscess has culturally yielded the diphtheroid bacillus, which is found in the enlarged lymph-glands in that disease. We also know that systemic actinomycosis may arise from alveolar infection due to the ray fungus.

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*Address before the Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Journal American Medical Association

Systemic disease, due to a focus of infection anywhere, is probably always hematogenous. The study of the infected tissues of experimentally inoculated animals and the infected muscles, joint tissues, lymph-nodes proximal to infected joints, nodes on tendons, etc., of patients, yield specific bacteria, and histologically there is found embolism of the small and terminal blood-vessels. Local hemorrhage and endo-arterial proliferation result in interstitial overgrowth, cartilaginous, osseous, vegetative and other morbid anatomical changes, dependent on the character of the tissue infected.

Partial or complete ischemia of the tissues due to the embolism is an important factor in the production of the morbid anatomic changes. Oxhausen of Berlin has produced, in animals, aseptic osteochondritis, resembling arthritis deformans, by ligating the arteries supplying the joint tissues. These principles are, I think, susceptible of proof that a chronic alveolar infection, and chronic foci in other regions also, may cause systemic disease by hematogenous bacterial emboli, which infect and at the same time deprive the tissues of nourishment. Local infection of muscles, joint tissues, etc., and lessened blood-supply result in the peculiar morbid anatomy of the respective tissues.

To investigate and manage these patients requires team work of the clinical and laboratory workers. The clinician must carefully examine the patient, exhausting every detail in the personal history. The skill of the dentist, the nose and throat specialist, the gynecologist, the genito-urinary expert and others may be necessary to locate the foci of infection. The focus must be destroyed. Tissues and exudates of foci should be carefully examined and bacterial cultures made. Vaccines of the dominant bacteria may be made for subsequent use.

With the source of the infection removed, the attempt should be made to increase the defenses of the body against the systemic infection. This involves a long and tedious period in the chronic joint infections and also in some other systemic diseases of focal origin. Rest, both mental and physical, is essential. Good, wholesome food, pure air, optimistic surroundings and, if necessary, restorative tonics of iron and other drugs. Pain must be palliated by simple drugs like the salicylates. After a time passive exercise and later active graduated exercise must be followed to aid in the restoration of local circulation and to hasten restoration of the morbid changes of the tissues. Autogenous vaccines may be used in the attempt to improve the defenses of the body. In chronic arthritis, with the circulation of the infected tissues obstructed embolically, antibodies in the blood stream, even if augmented by vaccines, would have but little effect locally. In the later stages of chronic arthritis when the local circulation has been so improved that the tissues are flooded with blood, vaccines will be of undoubted value. Patients may, however, be cured of chronic arthritis by the other measures named without the use of vaccines.

To recognize the character of this class of systemic disease and to manage successfully the patient, the physician must have absolute control. This implies hospital care where team work of the staff may insure qualified clinical and laboratory workers.

PERIDENTAL INFECTION AS A CAUSATIVE FACTOR IN NERVOUS DISEASES*

BY C. BURNS CRAIG, M.D.,

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THE PRESENCE OF PUS in a body cavity has long been considered a finding of the utmost importance, of even grave significance, to which an almost innumerable number of symptoms may be attributed. Until recently, however, the existence of pus around the teeth has been lightly regarded and often rejected as a possible cause of serious systemic disorder. The delay in appreciation of the importance of the presence of infection about the teeth is, doubtless, largely due to the familiarity of the physician with the condition in patients whose symptoms seem too remote from the mouth to have any connection with it. Then, too, it cannot be denied that there are persons suffering from pyorrhea alveolaris in whom it has remained a purely local process.

The results of peridental infection would certainly be more disastrous were it not for two fortunate factors of safety, the one, anatomic, the other physiologic. The former is the fact that the pus usually has free drainage into the mouth. The latter factor is the establishment by the body tissues of various degrees of immunity against a continuous bacterial intoxication, for example, from *Bacillus coli communis*. Just as the colon bacillus sometimes overpowers the individual's resistance and produces a general intoxication, a localized collection of pus or septicemia, so may the bacterial flora of the mouth subdue the body resistance and originate an abscess, produce a general intoxication, or, entering the blood-stream, may establish a new center of growth in another region of the body.

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*Read before the Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Journal American Medical Association.

We may well ask, Is the alveolar pus pocket the depot of origin of brain abscess in those cases the origin of which has been unexplained, in which there has been no abrasion of the skin and no aural or mastoid infection? A purulent process in the posterior urethra, in the vagina or in the tonsils, is considered ample source for any arthritis, neuritis or endocarditis which may subsequently develop. Are we not then justified in considering a septic condition around the teeth a source of various disturbed states of health, no other cause existing? Especially is this probable when the correction of the local oral condition is followed by alleviation of the general symptoms. The proof of the responsibility of oral sepsis for certain diseases of the nervous system rests on no other evidence than that just expressed—when the dental condition is corrected the manifestation of disturbance in the nervous system disappears.

Peridental infection is by no means limited to the clinic patient; it is often found in those who have taken the utmost care of their teeth. In these cases the dental work has been faulty and the real status is only revealed by a Roentgenogram of the jaw. Crowns and bridge work are peculiarly liable to have incarcerated pockets of pus.

There seems to be no portion of the nervous system for which the subtle toxin of peridental infection has a predilection. Probably the most common symptom is paresthesia in the fingers and toes—a ''pins and needles'' sensation—a symptom common to other chronic intoxications. For a considerable period it has been observed that a bad condition of the teeth may be responsible for adjacent disorders, such as otalgia and tic douloureux, but the observation that stubborn neuritis of the sciatic or other nerve trunk or of the brachial plexus sometimes disappears after cleaning out the alveolar disease, is of comparatively recent date. The continual swallowing and absorption of pus is undoubtedly the cause of disorders of digestion, headache and finally an anemic condition almost cachectic. This depleted, exhausted state may often be associated with a melancholic state. It seems a far cry from mouth infection to mental disease, but when one witnesses profound depression clear up following the drainage of several alveolar pus-pockets, one is persuaded that the chronic intoxication, the result of absorption from the pent-up infectious process, was an etiologic factor.

Cases of pachymeningitis within the cranium have been attributed by reliable men to peridental infection. Doubtless, also, the peridental membrane has been the portal of entry for infection, causing various forms of arthritis, the etiology of which has been obscure. From a variety of disorders, the result of peridental infection, I have selected four of diverse character whose improvement, following a cleaning up of the dental condition was rather striking.

Case 1. Cardiac arhythmia associated with angina: The patient, a surveyor, aged 46, married, temperate in the use of stimulants and tobacco, began to be annoyed in August, 1912, with thumping of his heart at night. These attacks would awaken him out of a sound sleep, would last a few minutes and disappear. At first they occurred about every fortnight, but by December, 1912, the attacks of cardiac thumping were not only occurring every twenty-four hours, but were occurring in the daytime as well as at night.

In addition to the disagreeable pounding of the heart, pain had appeared. The pain at first crossed to the right side of the chest, but later into the left axilla and up the back of the head. This was accompanied by a feeling of anxiety and dread and compulsory immobility. In one attack consciousness almost failed. The only other illnesses the patient had ever had were lead poisoning in 1898 and "typhoid-pneumonia" in 1899. From these he had recovered completely and had enjoyed excellent health until this present illness. Syphilis was denied and the Wassermann reaction was negative. Neither clinically nor by Roentgen ray could anything pathologic be demonstrated in the mediastinum. The heart was of normal size and location. Accompanying the systolic sound was a subdued blowing murmur, and the pulmonic second sound was slightly accentuated. When not in an attack his pulse was regular and rhythmic, 70 per minute, and the systolic blood-pressure was 125 mm. Hg. He exhibited a coarse static manual tremor said to be familial. Examination of the blood, urine and gastric contents revealed nothing abnormal. A slight pyorrhea about the teeth was noticed but was thought insufficient to cause such grave symptoms. He was put on general hygienic and tonic measures and discharged. I was not fortunate enough to see him in an attack. Three months later the patient returned having made very little improvement. Roentgenograms of the jaws were then made and disclosed no less than three pockets of pus about the roots of the teeth. These were opened, drained and treated, and since that time, a period of practically six months, he has been entirely free from cardiac palpitation and its associated angina. Quite recently he writes: "I haven't had a shadow of trouble in the region of my heart."

Case 2. Persistent periarthritis: A man, aged 46, of good health and temperate habits, free from venereal infection, developed two years previously moderate swelling of the tissues around the middle joint of the right finger. It became painful on movement and any trauma made it worse. Use of the joint, for example, playing golf, also aggravated it, but cessation of vigorous use didn't cure it. He had never been a sufferer from sore throat and was not otherwise rheumatic. He took the "cures" at Aix-le-Bains and Carlsbad without noticeable benefit to the joint. In February, 1914, he noticed some tenderness of a premolar tooth. Examination revealed a slight discharge of pus from the adjacent gum. The tooth was drawn and found to be abscessed at the root. Within a fortnight the periarthritis began to disappear and two months later there was no trace of it.

Case 3. The commonest symptoms following absorption from peridental infection: A woman, aged 54, complained of "pins and needles" sensation in her hands and feet, pain and tenderness in the muscles of the back and calves, and considerable mental irritability. On examination she was found to be fairly well preserved for her years. Her heart was slightly enlarged in both diameters: pulse 84; blood-pressure 120; auscultation negative. In all the muscles of the back, particularly those above the spine of the scapula, were points tender on pressure; also various points in the inter-costal spaces were tender on pressure, especially the left border of cardiac dulness. Squeezing the muscles of the arms and calves caused considerable pain. There was no definite nerve-trunk tenderness. Besides this the physical examination showed nothing of significance except a profound pyorrhea alveolaris.

After a week of eliminative and tonic measures, during which no improvement was evident, she was advised to have the dental condition remedied. A dentist extracted several carious roots and cleaned up the pyorrhea around the better preserved teeth.

Within two weeks her gums looked comparatively healthy. Coincident with the improvement in her oral condition the tender points in her muscles and the paresthesia in the hands and feet diminished. Eliminative methods were continued for another three weeks, at the end of which time her muscles were in a comparatively normal state.

Case 4. Presenting a picture of an agitated depression in which the presence of alveolar pyorrhea of long standing was evidently an important exciting factor, but not, perhaps, the primary cause:

The patient, a woman, aged 59, well preserved and of more than average mentality. She sprang from a long-lived non-nervous stock; she had passed through the climacterian twelve years before without unusual disturbance. During the past three years she had sustained a series of shocks with great fortitude and for the time being without telling effect on her nervous system. Three years previous she lost her father, a year later her mother died. During the week of her mother's death she had had a nasal operation performed. Soon after this, financial losses occurred which were the cause of considerable worry. The patient continued in reasonably good health for over a year, that is, until six months previous to entering the hospital. At that time she went to a fashionable sanatorium, more as a pleasure resort than for treatment. While there she began to have attacks of dizziness. A physician told her she was suffering from mild heart-disease and prescribed Nauheim baths. After she had taken eleven baths the present "nervous breakdown" began.

When first seen the patient was greatly depressed and nearly always in a state of agitation, pacing the floor restlessly and recalling the loss of her mother as the greatest disaster in her life and weeping bitterly during every conversation. She said she was convinced she would not recover. At other times she spoke in a mournful tone without being able to give the exact cause of her depression.

Physical examination was entirely negative, except for a pulse of 100 and the condition of her teeth. Heart was of normal size and without pathologic sound. The stool when examined proved normal, except for slight evidence of catarrhal colitis. Blood examination showed hemoglobin, 78 per cent.; red blood-cells, 4,869,000; white blood-cells, 6,500; differential showed mild increase in the lymphocytes; the urine was normal. A test breakfast showed diminution in the hydrochloric acid content. A serum Wassermann was negative, and the spinal fluid was normal in every respect.

After a week of tonic measures without noticeable improvement it was decided to subject the patient to the ordeal of having her dental condition improved. A Roentgenogram of the jaw showed two abscessed roots under crowned teeth and a collection of pus beneath a faulty bridge.

The bridge work was removed and abscesses drained. During the following week the cloud began to lift, and she began to have moments of better humor and saw some possibility of looking at the brighter side of things. The patient was then sent to the country for two weeks from which she returned in a comparatively happy state of mind. She arranged to take some hydrotherapy treatment at the hospital, but a few days later decided to go visiting instead.

The message of this paper is that the obvious is too often disregarded in searching for some profound cause. The discovery of a purulent process similar to that frequently seen in the mouth in other regions of the body would be sufficient ground for the hasty summons of the surgeon. A full appreciation of the possible dangers from infection around the teeth should lead us into council with the dentist. This is in no sense a criticism of the dental profession, but rather a plea for the closer co-operation of the medical man and the dentist. After an expert dentist has properly cleaned up alveolar pyorrhea or abscess, we find vaccines, as a usual thing, unnecessary.

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ABSTRACT OF DISCUSSION

DR. ARTHUR D. BLACK, Chicago: One phase of this subject, of interest to both dentist and physician, which has not received the consideration that it should, concerns the pathologic changes that take place in the tissues which are involved in the establishment of these foci in the mouth. We have in the mouth two groups of chronic foci: the chronic alveolar abscess and the so-called pyorrhea pocket, both of which involve a single tissue—the peridental membrane—which is the important factor in establishing the chronicity of both groups of cases. As a result of the involvement of the peridental membrane, either at the apex of the root or beginning at the gingival margin, there is a suppurative destruction of the attachment of the tissue to the cementum covering the root of the tooth. As a part of this process the cementoblasts, which overlie the surface of the cementum within the peridental membrane, are also destroyed. These are the only cells which could cause reattachment of that tissue. Soon after detachment, the fibers of the peridental membrane, which passed from the cementum of the detached area to the bone, disappear, and a little later the bone to which they were attached is absorbed. Thus all of the specialized elements necessary to the connection of root with bone are lost, and we cannot have reattachment of this tissue to the cementum of the root. This is shown very clearly by the Roentgenogram in both groups of cases. Careful examination of these will show a line down the side of and close against the root, which is practically always in advance of destruction of the tissue elsewhere, showing clearly that this disease has begun at the junction of the peridental membrane and the cementum. There is a progressive involvement of peridental membrane and bone, making the whole area about a given tooth funnel-shaped. Within the past few years I have cut away the tissue forming these pockets from the roots of teeth for microscopic examination. In one case I removed the tooth, peridental membrane and a section of the alveolar process and overlying gum tissue all in one piece, and had sections made for study. These sections show that the above mentioned changes take place and that detachments are permanent. Therefore pockets remain about such teeth and the overlying tissue is subject to frequent reinfection. We should not, therefore, expect vaccines to have any more than temporary effect on the local focus, because we have a condition here in which the physiologic possibility of repair is gone. The dental treatment indicated is the elimination of the focus in the case of the alveolar abscess by resecting the denuded root end, or the extraction of the tooth. If it is a pocket alongside the root, exposed to the fluids of the mouth, the tooth must be extracted, or palliative treatment employed which will be effective against reinfections.

DR. M. I. SCHAMBERG, New York: Dr. Billings gave a clear and concise description of the mode by which infections of the mouth reach these parts, and I was disappointed that he did not, even cursorily, touch on the possibility of a septic endocarditis, and likewise of producing secondary infections about the body other than those that apply to arthritis deformans. I, with many others, have been observing these conditions for a number of years. Our findings have been largely clinical up to within possibly a year or two, since which time, through the co-operation of the laboratory and the medical diagnostician and interns, we have been able conclusively to prove that the mouth is a prolific source of primary infection, bringing about serious sequellæ. It is equally important that we remember that the absence in the Roentgenogram of the dark area is not essential to the conviction of a particular tooth as the cause of these secondary troubles. Only recently in a case in which we were anxious to find the bacterium producing the effect on the patient's general health, a tooth was removed which showed an incomplete root-canal filling with no apical disturbance whatever. On crushing off, under aseptic conditions, the tip of this tooth, from the putrescent material in the apical end of the canal, we were able to grow a pure culture of *Streptococcus viridans*. Likewise, in a case of rheumatoid arthritis of fourteen years' standing, the patient, who was unable to walk, was brought in with a history of a thorough survey of the mouth for any possible etiologic factor in that region. I finally found among the few remaining teeth a tooth that had been comfortable through all these years, but the Roentgenogram showed a slight area about the end. We removed the tooth and from it produced a pure culture of *Streptococcus viridans*. In this case the history of the work done on the teeth recorded that it had been treated some sixteen years previously, which was two years prior to the onset of her articular trouble. The technic described by Dr. Gilmer in taking the pus from the mouth is probably a satisfactory one. I have at the Post Graduate Medical School in New York, been swabbing the gum tissue on the teeth with a strong tincture of iodine, and then, by means of a sterile swab, have taken the pus exuding from the fistula. The efficiency of this method is shown in a case in which we were searching for an organism. After two or three attempts we had absolutely no growth of the organism, so that in this rather filthy mouth we were enabled, through the swabbing of the parts with iodine, to bring no contamination from the mouth. In this case there was a copious discharge of pus which produced no organism whatever, though we used, of course, every medium used at present for the growth of these organisms. These observations, together with those already given, I am sure will encourage many of us who have not applied ourselves to the study of these infections about the teeth, to co-operate more with the interns toward the eradication of these systemic diseases.

Dr. W. A. Price, Cleveland: What is a dangerous infection of the mouth? Is the Roentgenogram a reliable means of diagnosis or not? I think Dr. Gilmer used the term "invaluable" provided the Roentgenogram was properly taken and interpreted. The Roentgenogram is simply the recording of relative densities, and relative densities do not show infections of the cellular tissue of the bone. We may also have an infection without an area of lesser density as occurs frequently in necrotic bone. It is frequently necessary to have a Roentgenogram to show an area of absorption by its lesser density, but, on the other hand, it does not follow that there is an infected condition because the Roentgenogram shows an area of relative lesser density. We are confronted with this problem: Patients will present themselves to members of the dental profession with Roentgenograms made by physicians with the demand that we extract everything that shows an area of resorption. If we object, what shall be our reason for not extracting? Immediately our profession must come to the point where we can answer these questions intelligently, and I know of no other way to meet the situation than to make exhaustive studies and thus obtain sufficient knowledge of these cases to establish means for their differentiation and correct diagnosis. The results of our studies so far on this phase of the subject strongly suggest that the field of pathogenic culturing may be a great deal smaller part of the area of infection than we have thus far suspected; that our active culture may be in the cellular tissue, about the apical end, or adjoining a pyorrhea pocket, and perhaps in a very limited area. Is it possible for a vaccine to be effective when we do not use instrumentation, or extraction or otherwise obliterate the focus of infection? Dr. Emerson, Dean of the Medical Department of the University of Indiana, made the statement in effect recently, that, in such a case, no vaccine ever did or would do any good. That is his point of view, and another is that established by the history of clinical cases in which no other treatment than vaccines were used and which as emphatically indicates the affirmative to some observers. We must recognize, therefore, that this is an open question, because men of such prominence and ability would not make such deductions without some good evidence; so let us attack these problems with new energy and from every angle that can add new light, for only incomplete truths contradict.

Dr. F. B. Moorehead, Chicago: The dentist should keep three things in mind. First, the work of Rosenow in the transmutation of the streptococcus and also the pathogenicity of the streptococcus at different grades of virulency. By animal passage he changes the affinity of the organisms for certain tissues. In this way lesions of the joints, mucosa of stomach and duodenum, heart, etc., are produced in animals. The mouth is a field in which this group is most frequently found. Secondly, when tissue changes have taken place to a certain extent, there is little hope of repair. When the cartilage is destroyed the most that can be hoped for is the prevention of any further changes. Hence, the importance of the removal of these foci early, before serious tissue changes have taken place. Thirdly, the placing of the mouth in a state of health without the ruthless destruction of teeth. While it may be wrong to extract some teeth it is not so wrong as to keep some teeth in some patients' mouths. It is far better to take out teeth than to sacrifice the comfort and usefulness of the patient. One must weigh the value of the teeth over against the health and the usefulness of the patient to society; that is the problem we have to face. When teeth may be saved with safety to the patient they should, of course, be saved.

Dr. John S. Marshall, Berkeley, Cal.: Dr. Billings was the first general practitioner that I know of to appreciate the fact that suppurative conditions of the mouth might be the cause of general septic conditions of various kinds in the body. He will probably remember that as far back as 1886 he sent several children to me who had enlarged cervical glands for which he could not account, with the request that I examine these children and see if I could find any diseased conditions in their mouths. I did find molars in every one of these cases with devitalized pulps and abscesses at the root. The extraction of these teeth in a short time cleared up all the inflammation in the cervical glands. I feel that this should go on record because that was a good many years ago.

Dr. V. P. Blair, St. Louis: Does Dr. Gilmer consider it necessary to curette and disinfect the cavity after the removal of a tooth with a septic area at the apex?

Dr. G. V. I. Brown, Milwaukee, Wis.: Dr. Billings and Dr. Rosenow have not only revolutionized the practice of dentistry, but they have revolutionized the practice of medicine, and the essential feature of the work, as Dr. Moorehead reminded us, lies in the transmutation of these micro-organisms. Our old standards are lost and we are facing entirely new conditions in the matter of technic whereby these bacteria can be studied, and that was the strong point in Dr. Gilmer's paper. This question of technic is a difficult one, as everybody knows, who has tried it. My friend, Dr. Yates, in Milwaukee, has isolated micro-organisms in connection with Hodgkin's disease and is doing extensive work with Dr. Bunting in that direction. I have recently exhibited a patient for the purpose of calling attention to some of these features. The Roentgenograms show, in the hand and finger joints and various other places, evidence of arthritis. The patient had pyorrhea and she has obviously a diseased sinus. She has been treated several times with bacterial products and we are now directing treatment to relieve the sinus, and the difficulty is to know how to do it. We believe, of course, that serum treatment in a case like that would not do that patient any good. The question of definite prevention and the necessity for further study of the efficiency of vaccine, which I think we are agreed is limited, are brought out in the papers of Drs. Billings and Gilmer.

Dr. W. O. Bridges, Omaha, Neb.: The work of Dr. Rosenow and Dr. Billings and their coworkers in the line of the relation between the foci of infection and general disease has stimulated the medical profession the world over with reference to the determination of the foci of infection in cases that have heretofore not been looked on as anything but general disease represented by general infection. It has been my privilege in the last few weeks to come across some cases illustrative of these points that are impressive. I have studied for the last year relationship between bacterial infection from the mouth and the serious anemias which we see -some pernicious and some secondary of a high type—and I have been struck with the influence of treatment directed toward these mouth infections. I have in mind two cases of secondary anemia in which the blood count showed fifteen hundred thousand red cells, and in which the patients had steadily gone down hill; so emaciated that they could hardly get about, and who had been through the regulation treatment for anemia with no results. Examination of the mouth indicated pyorrhea, with almost every tooth left in the mouth loose. All bad teeth were removed and mouth washes instituted and the treatment for anemia carried out. The results were perfectly astonishing. One patient, when he returned five months later for further operation, showed a blood count of four million red cells and was free from every tendency to anemia.

Another young man had gone six weeks with serious symptoms of general infection represented by chills and fevers, serious suggestion of malarial fever, but a diagnosis was made of septic endocarditis. It was impossible to find any indication or ordinary physical manifestation. We looked thoroughly for the focus of infection but found nothing except that in the throat the tonsils seemed to be unhealthy. I suggested that a throat specialist be consulted. The specialist discovered an abscess. The cavity was irrigated and the temperature went to normal in twenty-four hours; the patient had no further chills or fever and finally recovered. It has been my privilege occasionally to see lesions about the mouth which did not respond to treatment, in which cases the Wassermann test proved positive and the patient, put on salvarsan, recovered.

These cases illustrate the opinion, I think, that the mouth furnishes a large proportion of infection which we overlook. We in general practice find a large proportion of people who never saw a tooth brush; who do not know anything about the care of the mouth. If these cases were considered by the physician with reference to inspection of the mouth more generally, more patients would be referred to the dentist and have carried out mouth sanitation in the proper way.

Dr. Henry W. Frauenthal, New York: We have made it a routine practice by means of a dentist connected with the institution to have all the teeth examined, and it has been remarkable to see how many chronic joint conditions are benefited by cleaning the teeth. I think one of the most common sources of infection has been in poorly built bridges and caps, work done indifferently, in cases in which infection existed. On removing the caps we find infection existing. A number of these cases have been shown in the New York Dental Clinic. A patient on my service had been treated for rheumatism in several institutions previous to admission to the hospital without any benefit whatever. Her pain was so acute that she attempted to commit suicide twice, having been informed that her condition was chronic, and would never improve, but, on the contrary, would gradually grow worse. Owing to the condition of her gums, I made a diagnosis of joint condition due to septic pyorrhea alveolaris and with no other treatment but the correction of the mouth infection, as done by Dr. Harry A. Goldberg, an arthritis involving both knees, left ankle, right wrist and elbow, cleared up in ten days, and at the end of three weeks the patient was discharged cured. Her temperature varied from 98 to 102 F., with a corresponding pulse. This condition extending over a period of nine months responded to treatment in ten days

Dr. T. W. Corwin, Newark, N. J.: In regard to the search for the foci of infection, two points may be of interest. For instance, the appearance of the tonsils may be quite normal, but if the routine practice is adopted of making pressure on the tonsils with some instrument, frequently one will find an exudation from the crypts of matter which may be worth while investigating. Another simple procedure that I believe will prove valuable in many cases, and especially those in which there is a manifestation of anemia, is, whether it is necessary to make an observation of the temperature or not, to put the clinical thermometer under the tongue; before reading the temperature, if you will pass the end of the thermometer under your nose, frequently you will discover a fetid smell. Perhaps these two little points may be of assistance when searching for the focus of infection.

Dr. W. H. Mercur, Pittsburgh: I read a paper not long ago by Dr. Morris Manges of New York, on the "Mouth as a Means of Diagnosis." I have met but few men who have read it; it is certainly most appropriate to the present discussion. In this article he shows how easy it is to examine the mouth and how hard it is to examine the stomach and other organs that we give so much attention to. In this article I think he speaks of eighteen different diseases which can be absolutely diagnosed from inspection of the mouth alone.

Dr. J. A. Pettit, Portland, Ore.: I have put on record a number of cases which have come through our service, illustrative of the salient points brought out here. Many of us have had experiences in this connection, which are similar in the gross, but vary in minor details. We are undoubtedly entering on a new era of therapeutics, medically as well as surgically.

This subject is undoubtedly in the early stage of development; what the next few years will bring forth is hard to tell. Instead of bending our efforts to the relief of the ravages of infection, we are searching for the sources of infection and reaching out with the use of vaccines and other remedies to overcome them. This is the broad field of therapeutics of the coming day. Preventive medicine is gradually extending out and overshadowing the former field of materia medica and drug therapeutics. Heretofore, remedies have been applied for the relief of conditions which we are now able to prevent. In the face of all the admirable and life-saving work done by medical research and study, it is disgusting to be compelled to listen in dignified silence to the malevolence of ignorance displayed by various cults, and at the same time observe them taking advantage of the very life-saving procedures which the medical profession had discovered and devised.

Dr. Frank Billings, Chicago: In my address I did not go into the details of every variety of disease that seems to be related to focal infection, but rather tried to give the principles of it. I think we should not use the word "cause" too much in relation to the focus of infection of a systemic disease. We should not, even with the focus before us, say that that focus is the absolute cause. I think we will have to use the expression that it is the predominating etiologic factor because there are so many other factors to be taken into account. None of us, it does not matter what our position in the profession may be, is capable of passing judgment on all things, and for that reason we have at the Rush Medical College clinic endeavored to encourage what we call team-work. I, myself, never pass on a special infection except when it is related to something that I think I am a better judge of than the other men. For instance, Dr. Moorehead is asked to pass judgment on the mouth, so far as the jaws are concerned, and I make him responsible. The best men in their lines, men who are teachers in the college, I ask to give judgment about an infection of the sinus or tonsil. Sometimes we call surgeons in with reference to some infection in the abdomen or elsewhere that I think may add to my own knowledge of the condition before we proceed to do anything. I do not pretend today to carry out the technic in bacteriology. We have such men as Drs. Rosenow, D. J. Davis, H. K. Nicoll, Gaarde and other bacteriologists, working at the problems. We must all get together. The oral surgeon has no right to diagnose a systemic condition of the patient and say outright that the mouth is related to it; he should have the family physician co-operating with him before he reaches that point. Nor should the family physician nor the one having general management of the patient order teeth out without the definite advice of the oral surgeon who is capable of giving it. I believe there is much in that principle that there is a focus of infection that is the predominating factor in many systemic diseases. This is, perhaps, expressed more commonly in arthritis of the chronic type than in any other disease that we can mention, but it is in many. Besides arthritis, we have traced this same hematogenous infection with its embolic conclusion of the end artery as the cause of cholecystitis. Hyperplasia in the thyroid gland, which occurs commonly in rheumatism, is associated with infection of the tonsils. The hyperplasia disappears with all of the clinical phenomena with the cessation of the tonsilitis. Also in hemorrhagic nephritis, the streptococcus obtained from that producing tonsilitis, causes hemorrhagic nephritis in the animal, etc. So that the application of the principle is much wider than the average practitioner thinks.

Dr. Thomas Gilmer, Chicago: To find the cause of a condition and locate its origin is all-important, but we must go further back than this. Infections in the mouth are due, in the great majority of cases, to improper hygiene. We all recognize the uncleanly condition found in nine-tenths of the mouths which come under our professional care, although the patient may be otherwise scrupulously clean. I venture to say that if we should examine the mouths of the physicians in attendance in the various sections here today, few would be found clean, or even approximating a hygienic condition It is well to cure our patients when they become diseased, but it is far better to prevent disease by teaching the people the importance of the care of their mouths, that they may not suffer from disease primarily brought about by lack of care of the teeth. Dr. Blair asked if I considered it important to curette and disinfect bone cavities after the removal of a tooth with a septic apex. As a rule I should answer in the negative. The curettement depends, of course, on the stage of the infection and the area involved. Chronic abscesses may be profitably curetted in some cases, but in the acute cases it should never be done. In acute cases I am doubtful about the use of antiseptics. I think it would be just as well to use simply a normal salt solution. Antiseptics, if strong enough to destroy bacteria, would prove detrimental to the tissues; besides, we cannot penetrate the tissues with an antiseptic so far as the bacteria have gone. Is it not true that by curettement we cause a greater traumatism which renders the tissues more liable to greater infection?

A STUDY OF THE BACTERIOLOGY OF ALVEOLAR ABSCESS AND INFECTED ROOT CANALS*

BY THOMAS L. GILMER, M.D., AND A. M. MOODY, CHICAGO

SINCE BILLINGS, ROSENOW and other internists have found the mouth a prolific primary focus of infection, fraught with secondary manifestations of grave consequence, it has been thought desirable that a closer study of the bacteriology of alveolar abscess, both acute and chronic, as well as the infectious material found in pulp chambers and root canals, should be made.

The impression generally entertained that alveolar abscess, both acute and chronic, is due to the *Staphylococcus albus* and *aureus*, seems from our study not well founded. We have received this accredited opinion, not from written statements, but from questions put to those who we knew had had such experience in the observation and treatment of alveolar abscess, and their answers have been expressed as before indicated.

One looks in vain for statements in books which treat of alveolar abscess of opinions on the bacteriology of this disease. The subject has been thought either of too small consequence to warrant discussion, or too difficult of solution. We recognize that abscesses of the jaws are by no means the only mouth conditions to which joint, heart and other lesions may be attributed, but we have made our study of the bacteriology of tooth infections partly because so little attention has been given it and because we were able to gather from such foci specimens with less liability of contamination, than from pyorrhea alveolaris pockets, for instance. The mouth, even in health, affords a great flora, both of pathogenic and non-pathogenic bacteria, therefore great care and painstaking was necessary in the collection of material which would be uncontaminated.

In gathering specimens from acute alveolar abscess, the field to be incised was made as nearly aseptic as possible by thorough washing with fifty per cent. alcohol, and as soon as the incision was made, a sterile pipet was introduced deeply into the abscess and the pus collected. The pipet was then sealed and sent to the laboratory.

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*Read before the Section on Stomatology, American Medical Association, of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Journal American Medical Association.

*From the Laboratory of St. Luke's Hospital.

In the chronic infections, abscesses without sinuses were selected and similar precautions observed for the collection of specimens. In others, the pus was collected direct from the pulp canals of teeth having no cavities of decay, the tooth being thoroughly washed with alcohol after the application of the rubber dam, then drilled through into the pulp chamber with a drill, and as the pus welled up from the canals it was received in the pipet. In others, the pus was collected from the apices of freshly extracted teeth which had been removed under careful aseptic precautions. The specimens from septic root-canals were gathered from teeth recently removed. In order to expose the root-canals the teeth were enveloped in sterile gauze and placed between the jaws of a vise and crushed, others were flamed and the roots then split with sterile bone-cutting forceps. These methods exposed the pulp-chambers and root-canals from which the specimens were obtained. In some of the teeth thus examined there was found pulp-tissue partly gangrenous and partly alive, in others only necrotic elements of the pulp, the pulps in some having been dead for a long period of time, as indicated by the presence of old imperfect root-canal fillings.

The presence of bacteria of various kinds within the structures of the teeth and the tissues adjacent to them was demonstrated many years ago by Miller (Micro-organisms of the Human Mouth), and others. From our work it would seem that we are now able to classify the more important organisms which correspond in many respects to descriptions and photomicrographs of bacteria of the dental structures appearing in the literature as early as 1881. Our conclusions are arrived at from some forty odd bacteriologic examinations, which it has been our privilege to make of material from acute, subacute and chronic or latent infections of the jaw and teeth. There were sixteen acute alveolar abscesses, eighteen subacute or chronic abscesses and eight teeth with diseased root-canals from which material was received for bacteriologic examination.

In the main there has been a great similarity in the results obtained. We believe that to obtain such constant results as we have, the same technic should be employed. That technic is the following:

After receiving the material to be examined, collected in the manner described above, it is smeared on the surface of blood-agar or ascites-dextrose-agar slants. One tube is placed under anærobic conditions by the addition of pyrogallic acid and a few drops of sodium hydroxid to the tube after the cotton plug has been pushed in about one-third the distance from the top. The tube is then plugged with a plain cork and sealed with paraffin. The other inoculated tube is kept under ærobic conditions and both are placed in the incubator at 37 C. (98.6 F.).

Within twenty-four hours one will usually see a fine granular growth over the surface of the ærobic blood-agar slant. If one examines this closer the growth is seen as fine greenish colonies. The water of condensation contains chains of these organisms which are usually Gram-positive. There may also be a similar growth in the anærobic tube but one cannot distinguish the green color. At the end of forty-eight hours, however, there is quite a change in the appearance of the anærobic growth; it is very luxuriant, grayish-white in color and the colonies have a great tendency to fuse. On opening this tube one notices immediately a very offensive odor.

The above hurried gross description of the cultures will hold for the great majority of the specimens from the chronic infections examined. The variations are due to the predominance of one or other of the principal organisms present, and to whether or not the material cultured has been contaminated with unimportant bacteria from the mouth. The bacteriologic results in our series of acute abscesses differed mainly in the ærobic findings. In these there were varying degrees of hemolysis of the blood.

From the microscopic examination for further identification of the organisms in question, we found the predominating organism to be a streptococcus. We have obtained many graded variations from a hemolytic streptococcus with a wide zone of hemolysis in the acute abscesses, to a *Streptococcus viridans* in the chronic, and just recently one in which a *Streptococcus mucosus* was the predominating organism. These organisms, particularly the green-producing streptococci, will in many instances grow as well anærobically as they will ærobically.

. The anærobic cultures which do contain streptococci are rarely pure. Some contain *Bacillus fusiformis* in varying numbers. A few of these tubes, however, have practically pure cultures of fusiform bacilli.

The above results are what we have learned to expect, but there are many other organisms which occur with these. Aerobically we occasionally obtained isolated colonies of *Staphylococcus aureus* or *albus*, *Micrococcus catarrhalis*, and some unidentified saprophytic organisms. In two instances a diphtheroid bacillus has been found which grows under both ærobic and anærobic conditions.

Anærobically, in old cultures, we have seen in material from three different abscesses a black pigment-producing organism. This organism is slow growing and does not usually appear for about five days. We do not believe that it is of any importance in these infections.

In three of the chronic cases from which material was examined the patients were treated with autogenous vaccines with strikingly beneficial results. The vaccines were made from the cultures of both the ærobic and anærobic organisms, and were given in graded doses at five-day intervals.

These were chronic suppurations, following that class of acute infections of the mandible characterized by much brawny swelling, persisting over a week or more with little or no indications of pointing. The pus discharge continued with no seeming diminution for several weeks after the acute symptoms had subsided. In each instance the pus flow stopped promptly on the use of the vaccine treatment.

Those who have made extensive observations of the tendency of acute attacks of alveolar abscess recognize that they occur epidemically. Whether the epidemics of streptococcus nose and throat infections follow or occur simultaneously with epidemics of alveolar abscess is a question both of interest and importance. We have not sufficient data to warrant a definite statement relative to the subject, however, since we have found in both infections the same bacteria; and as both occur epidemically, it may be discovered that there is a very definite relationship between the two infections.

It seems reasonable to suppose that the presence of the streptococcus of nose and throat infections may easily cause simultaneous or secondary infections in the jaws, the organisms reaching the apices of the roots through cavities of decay in the teeth, or through the circulatory channels.

Since the discovery of a positive relationship between tonsil infections and secondary manifestations in other organs and parts, tonsils have been removed wholesale, in some instances on slight provocation. Their removal has, we fear, become with some almost a fad. A similar fad is growing up relative to the removal of teeth, since the discovery that jaw abscesses and pyorrhea alveolaris are equally as potent foci for secondary infections as are the tonsils. Some physicians are rather indiscriminately sending their patients to the extraction specialist, requiring removal of several or all of the teeth, supposing them to be a factor in some lesion, when their removal is not always justified. A Roentgenogram, if properly made, is infallible, and can be absolutely relied on providing its interpretation is correct, but an improper exposure may lead one, if inexperienced, to mistake a part of the maxillary sinus for an abscess at the end of the roots of the second bicuspid or first molar. Other errors from incorrect readings may lead to similar wrong conclusions.

Some jaw abscesses may be cured by treatment through the tooth's root, still others by surgical interference, other than by extraction. Pus appearing at the free margins of the gums does not always indicate the so-called pyorrhea alveolaris. It may be due to lime deposits, the removal of which permits a speedy return of the gums to health. The diagnosis of this class of pathologic conditions of the mouth requires special study and an educated technic.

People's Gas Building—St. Luke's Hospital.

IMPLANTATION OF AN ARTIFICIAL ROOT*

BY W. E. JOHNSTON, INDIANAPOLIS, IND.

The clinic given was a modified method of Dr. Greenfield. First: The root is carefully extracted and the artificial root is then made of 24-gauge iridio-platinum wire into a series of loops with a central post, 14-gauge wire. I do not enlarge the root socket as Dr. Greenfield does, but simply make the root the same size as the natural root and insert. Use a retaining appliance for six weeks and then adjust the crown. Of course the operator must have everything aseptic at all stages of the operation.

*Office clinic, Indiana State Dental Society, 1914.

TECHNIC FOR MAKING IMPRESSIONS AND MODELS FOR ARTIFICIAL DENTURES*†

BY DR. WILLIAM A. GIFFEN, DETROIT, MICH.

I APPRECIATE THE HONOR and the privilege of appearing before you to discuss what, to my mind, is the most important subject in the whole field of prosthetic dentistry, viz., the basic principles involved in the construction of artificial dentures.

I have not a great deal that is original to offer, but have arranged in detail into one complete system what, in my judgment, are the best points from the various methods employed by other prosthodontists and which, in my hands, after considerable clinical experience, produce the best results. These I shall present for your consideration. Should I be able to smooth out for those of you who are interested some of the rough places in prosthetic work, I shall feel amply repaid.

To get the best results in artificial dentures, there are three steps which require the same accuracy of judgment and manipulation as that exercised in successful inlay or root canal work, and carelessness in any one of the three steps will invite certain failure to a greater or less degree.

The first of these three principal steps is a correct impression; the second, a perfect model that will remain unchanged in shape until the denture has been vulcanized and cooled; the third, a proper arrangement of the teeth.

No man should expect to make artificial dentures that will be practically successful until he has mastered a good technic for these three steps.

The most important part of this technic is the Greene method of adapting a plastic matrix to obtain a correct impression of the surfaces to be fitted. We shall, therefore, use the Greene inventions for the purpose of making the work as simple and accurate as possible.

Preliminary impressions and models of each case always should be made. This takes but a few minutes, and the time will be saved or made up later. This gives an opportunity also to judge the temperament of the patient and his attitude toward the operator, which is very important, especially with referred patients. It also demonstrates to the patient that you are giving the case careful consideration. From the models you can better estimate the difficulties to be met, and you can also fit trays to the preliminary models, which will require the minimum amount of impression material to make a correct impression.

Preliminary upper impressions: Select a Greene Method tray which will easily slip over the ridge, place enough "Perfection Impression Material" in the tray, molding it over the inside so the center will be heaped up, and leaving a slight excess around the rim of the tray; place the tray in the mouth and gently press it to position, and with the finger press the excess up under the cheeks and lip. Take a small gauze sponge wet with cold water and place it against the lingual surface of the tray to chill that portion of the impression; hold this in position and have the patient work the muscles of the cheeks and lip over the soft rim of the impression to show approximately the line of muscular attachment.

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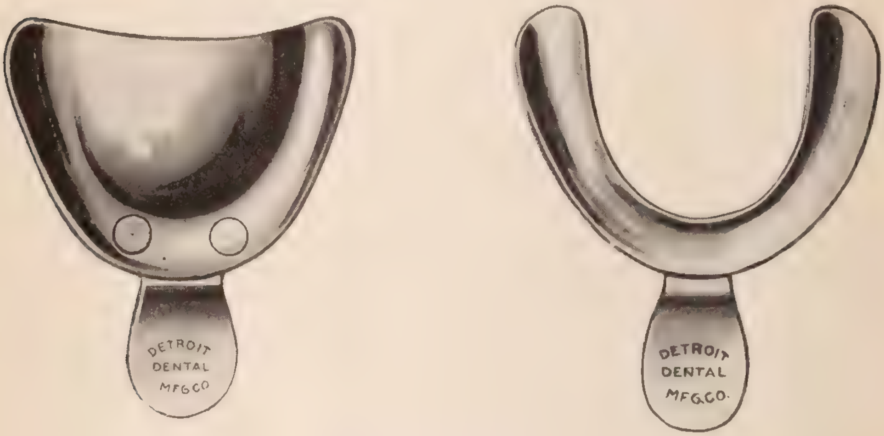
*Read before the Michigan State Dental Society, 1914, the Northern Ohio Dental Society, 1914, and the Ohio State Dental Society, 1914, and National, 1914.

†Illustrated with moving pictures.

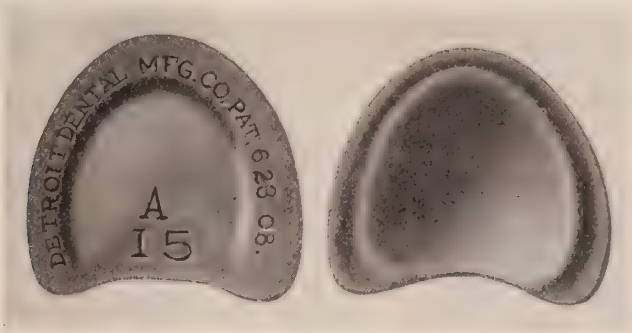


No. 1—Greene Method Impression Trays.

The preliminary lower impression should be made in the same way, except that the inside rim should be trimmed to prevent it from pressing against the muscles when the patient sticks the tongue out of the mouth as far as possible, thus allowing the muscles and the tissues of the floor of the mouth to press against the plastic inner rim of the impression.

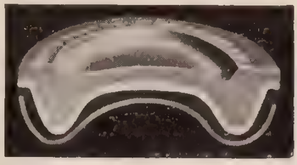
No. 2—Preliminary Impressions—upper and lower.

The preliminary models are made by selecting from the Greene ready-made, non-changeable, approximate metal models an upper metal model that will approximately fit the upper impression, and a lower metal model that will approximately fit the lower impression. A sufficient amount of plaster to cover the inside of each impression and the ridge of each metal model is now mixed, the upper metal model is gently pressed to position in the upper impression and the lower metal model pressed into the lower impression; and the excess of plaster which has been squeezed out around the edges wiped off. When the plaster has set the impressions should be stripped off and the models trimmed—being careful to leave the shelf portion which clearly defines the edge of the impression.



No. 3—Greene ready-made non-changeable Approximate Metal Model—upper.

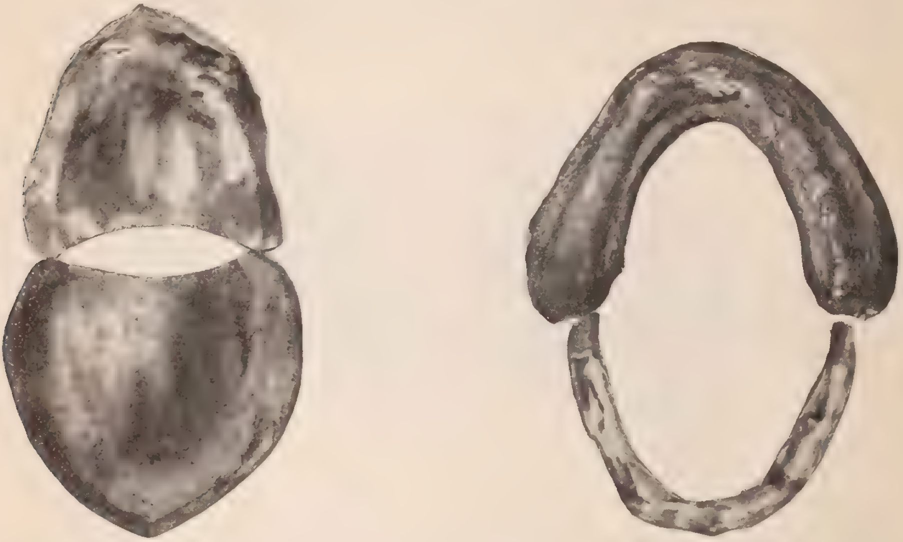
You now have models which are about 96 per cent. metal, with a thin film of plaster over them. No model can be made that is less changeable, and they will not warp or break and will stand a great deal of abuse. There is no possibility of squeezing them out of shape by careless packing, flasking or vulcanizing. Also by adding 25 per cent. Portland cement to the plaster, any kind of a metal base plate can be swaged over them perfectly in a rubber block swager. The writer also would suggest at this point that the only safe way to make a cast metal base plate is to make two models for each case, cast the base plate on one model and then swage it over the other model to correct any warping or change in shape which may have taken place during crystallization of the metal.



No. 4—Cross section of Model before separating, showing, *first*, metal tray; *second*, impression material; *third*, layer of plaster; *fourth*, approximate metal model.

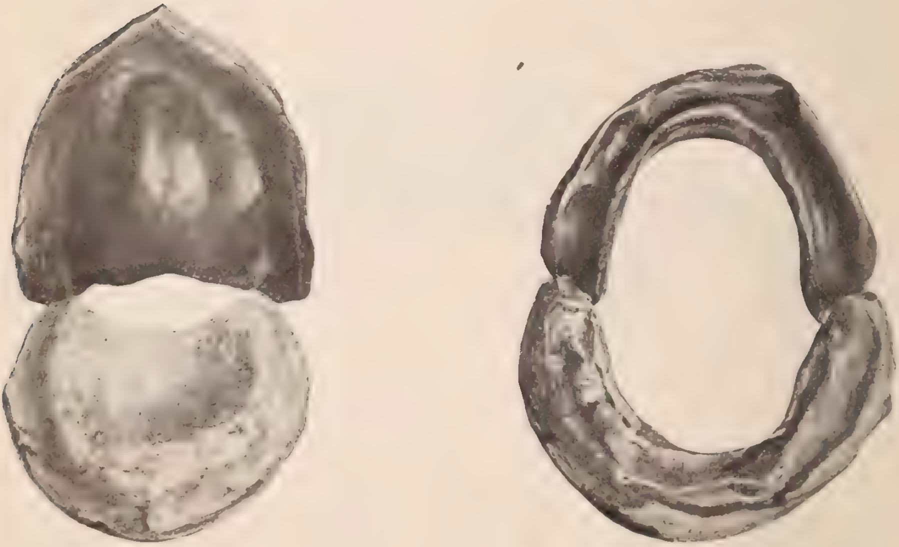
Trays are now made, for taking correctable impressions, by swaging Ash & Sons' No. 7 soft metal over these models in a rubber block swager. The trays should be trimmed a quarter of an inch shorter than the finished plate is to be, and the edge or rim should be only deep enough to prevent slipping. The edges of the trays, while still on the models, are opened about one-eighth of an inch with a knife, and are then taken off the models and a beading traced along the edge with a stick of Perfection Impression

Material; a wafer of the same material is warmed and spread over the inner surface of the trays, with the excess folded along the edges of the trays. The models are now coated with vaseline or cocoa butter, so the impression material will not stick to them; the impression material in the tray is softened slightly so it can be changed in shape, and the excess



Upper Lower

No. 5—Preliminary Models and Individual Trays.



Upper Lower

No. 6—Correctable Impressions made on Preliminary Models.

impression material on edges burnished up to muscle line on models with the fingers.

All of this work can be done by your assistant, and when the patient comes you are ready with an approximate correctable impression, which can be transformed easily into an accurately fitting test impression that will be correct in height and length, as the denture should be. It has about an equal strain on the hard and soft parts and relief, without a leak, for motion of muscles.

First step. Take correctable impression and pass back and forth over flame from small burner to soften the surface to a semi-flowing consistency, but not quite hot enough to burn your fingers at a touch. Always wet your fingers with warm water, and explain to your patient that it is not hot enough to burn.

Place the tray in position in the mouth and push up lightly. If the roof of the mouth is deep, work the impression slightly forward. When properly seated take a small gauze sponge wet from cracked ice and place it on the lingual surface of the tray, holding it in place for about half a minute; at this time, straighten up the impression material above the edge of the tray all round, but not tightly against the gum, and while the rim of material is still soft, ask the patient to work it down by moving the lips and cheeks. This gives you the approximate height of the impression, and now, with a fresh cold sponge, cool the rim. Now let go of the tray, and if the impression stays in place without any muscular movement to dislodge it, you know it fits the roof and bearing surface of the ridge. This test rarely fails; if it does, repeat the operation of fitting the impression.

Second step. When the rim has been trimmed approximately as to height, warm the rim slightly on the outside, and, with a sharp knife, shave off until the rim is about twice as thick as the finished plate rim should be. Next, trim the distal edge of the plate, leaving it about one-eighth of an inch too long.

The finished denture should be long enough to extend slightly into the soft tissues, but not far enough to interfere with muscular action in swallowing. Warm this thin projecting edge until it is quite flexible, place the impression in the mouth quickly, and have the patient swallow once or twice.

Take the impression out and find the distal edge turned down as far as the muscles have moved it, chill in cold water and trim off to where it turns down. Repeat and trim again if necessary. This valve pressure fit should extend clear around the impression behind the tuberosities. If at any point the rim is short, add as much as is necessary with a stick of impression material.

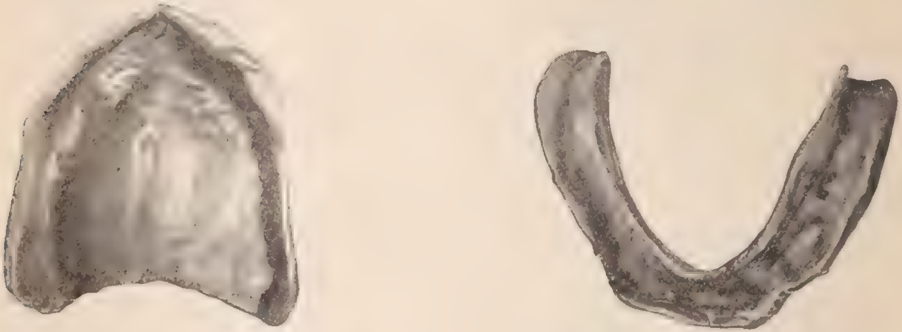
Third step. Re-test the roof and ridge by pouring a small stream of hot water into the impression and allowing it to run off at the heels. The rim must not be softened, but the center should be as soft as possible without burning the patient. Quickly insert it and immediately press it lightly and quickly. Repeat as often as necessary until the impression will stand a roof fit test, i.e., hang there snugly with no muscular motion to loosen it.

Fourth step. Correct rims to muscles. This is to get the exact height of the plate rim at every point and to get relief for the muscles without a leak. Warm the edge of the rim slightly and pinch it up, making it a little too high and thin at the top; now warm quite soft to a very shallow depth, place in the mouth, and with quick, vigorous movements of lip and cheeks work it down to proper height to fit the moving muscles.

I usually do this one side at a time, until every tissue, hard and soft, has cut its way into this very soft rim, over a hard under-stratum.

Frequently this part of the operation has to be repeated and particular points especially warmed where attachments of muscles are stringy, but persistence is sure to bring accurate results.

Unless individual muscle attachments require special attention, you can trim accurately the impression rim in a few minutes. Continue to trim until the natural movements of cheek and lips fail to cut any deeper into the softened edge.



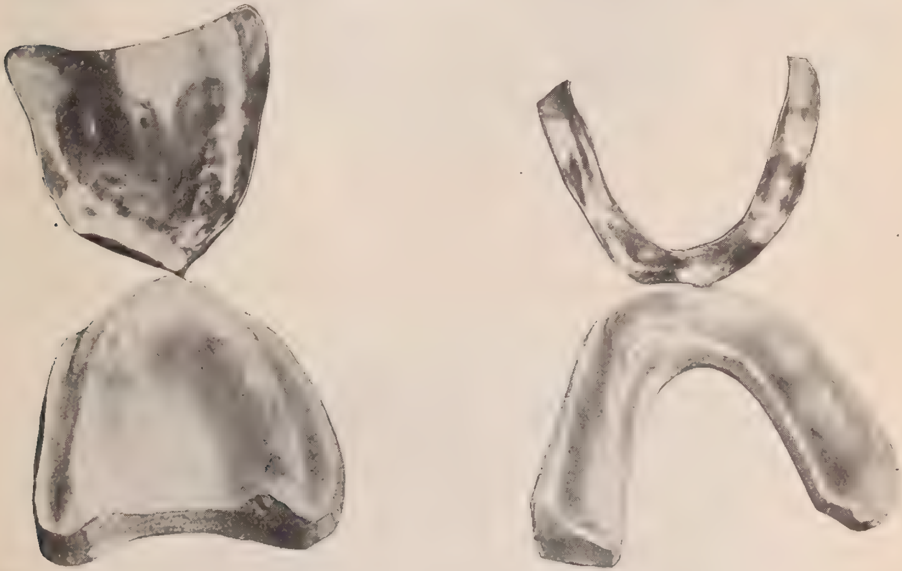
No. 7—Tested Impressions.

Fifth step. In conforming the rim to the buccal and labial surfaces of the ridge, gentle pressure must be used on the soft or compressible areas. These surfaces are always harder in some places than in others. The work must be done very carefully, as it is of utmost importance in many cases.

Slightly warm the rim of the impression extending beyond the edge of the metal tray on the left side by passing it over the flame, slowly warming it through from the outer side until it reaches about the softness of the palm of your hand; slip it into place in the mouth quickly and as quickly place a cold cotton roll between the cheek and the softened rim, hold the impression in position with the right hand and press gently on the outside of the left cheek with the left thumb and hold it for about half a minute, until the cold roll chills the impression material to prevent rebounding when pressure is removed. The rim is conformed to the labial and opposite buccal surface in the same way. In easy cases, where there is a big mouth and thin lips, both sides and the front can be conformed at the same time. Next, gently warm the heel corners, replace in the mouth, and with cold gauze covering the index finger of right hand, gently burnish around the tuberosities.

Sixth step. Conforming the distal edge of the impression, the most important point for adjustment in the entire operation, slightly warm the edge projecting beyond the edge of the metal tray, place in position in the mouth and instruct the patient to press it up gently but firmly at the back part with the tongue and hold it for a minute, then finish and cool with finger pressure.

In practice as many of these details may be united as the case and the ability of the operator will permit. However, there is seldom any necessity for being in a hurry, the operation is not objectionable to the patient, and in most cases the patient is as much interested as the operator. I would add that few patients will ever feel satisfied that their impressions are properly made subsequently, unless the same care is used.



No. 8—Final Models with metal try-in base plates.

Final test. The finished impression is placed in the mouth and the patient is instructed to try to loosen it by moving the muscles of the lips and cheeks, or swallowing, or biting on the finger. If none of these movements throw the impression down, a plate properly made from it will not be loosened. However, if some of these movements loosen the impression, do not hesitate to readjust the part where loosening first takes place. If you do not correct it at this time, the alternative will probably be to remake the denture.

Lower dentures. The first requirement is a preliminary impression and model upon which to swage a tray that will fit the crest of the ridge and about one-quarter of an inch shorter than the denture should be. The same principles should be followed as in the upper impressions.

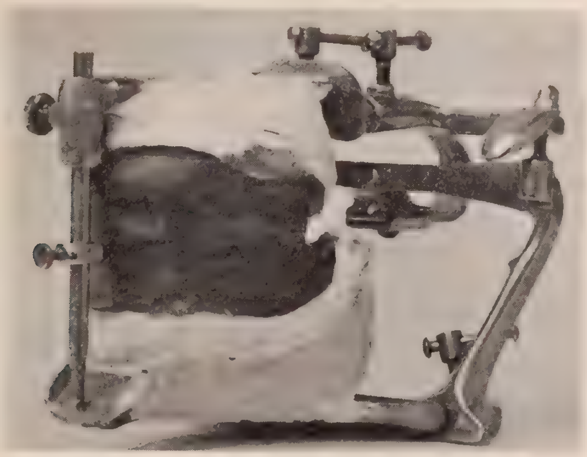
The outer rim and heels are trimmed to allow swallowing and lip and cheek movement. In trimming the lingual edge for the soft tissues of the floor of the mouth, the edge must be warmed until it is very soft and the instant it is slipped into the mouth the patient must bite down on the rests, swallow and move the tongue all over the roof of mouth as vigorously as possible. The impression is then cooled and the excess material trimmed off with a knife, and the operation is repeated until there is no more excess to turn up.

No. 9—Metal Try-in plates with wax rims built on.

No. 10—The Bite with articulator representing patient.

Now conform to lingual surface of ridge by warming until it is quite flexible, and have patient press steadily with the tongue for a minute and finish with cold finger pressure, but don't bear hard nor press downward when retouching.

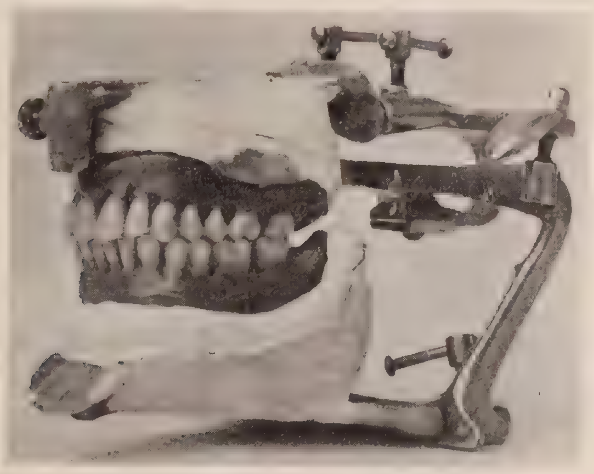
Test for fit. The impression is thoroughly chilled, placed in the mouth, pressed down with index fingers for about a minute; if it sticks fast, or even if it comes loose with a little noise, it is correct. If not, alter it where it is strained up first. The denture made from such an impression will always test better after it has become properly seated.



No. 11—Try-in or Bite Plates transferred to articulator.

Final models are now made in the tested impressions exactly as the preliminary models were made.

The impressions pulled off and the metal trays cleaned and reswaged



No. 12—Showing the teeth placed in wax on try-in plates ready for a try-in for final adjustment.

to the models, they are now known as bite plates, upon which build rims of base plate wax. The metal bite plates have many advantages. They fit as accurately as the finished plate will fit; the heat of the mouth will not cause them to soften and bend out of shape; they will stay in position; they require the minimum amount of wax to take the bite; the patient will not object or become impatient while you are building on or trimming for feature restoration.

When the bite has been taken and the face bow attached, they are taken out of the mouth and placed on the models and the models attached to articulater. After the condyle path has been established, and the median and lip line marked, they are ready for placing the teeth by simply cutting out the wax rims in sections as the teeth are set up. The metal bite plates take the place of the wax base plates. This is also of great advantage; they protect the models from getting daubed up with hot wax; they are exactly the same thickness that the roof of the finished plate is to be, and the surface shows any ridges or irregularities the roof of the mouth may have. Consequently the plate will have a more natural feeling to the tongue. The plate will require the minimum amount of polishing, and will have the maximum amount of strength in the roof of the plate with the minimum amount of rubber.

DISCUSSION—MICHIGAN SOCIETY

DR. KNOCHE, Chicago: As far as I have been able to find out in my own clinical observation, this is the only way to take impressions of any part of the mouth, where you have to depend on the displacement of the soft tissues in order to allow the saddle portions to fit well on the hard bony portions. I wish to compliment the Michigan State Society for having a president who will give you such a thing as this. It has been worth the trip to Detroit to see this technical work in the way it has been shown here. I think ultimately most of the things of this kind will be taught in very much this same manner.

To speak a little more definitely on my observation in regard to this matter, I had a case almost heart-breaking for two and a half years. The man had an upper jaw as flat as a shoe horn. In the lower jaw he had a removable bridge, a large denture that I placed there. So far as I could see, the lower denture was a success. I think I made plates for him of all descriptions: vulcanite, aluminum, gold, platinum; for two and a half years I worked almost every three months making him a new denture. I was using the impression method, using the plaster, attempting to trim those parts that Nature had created in the degree that Nature would allow me, with the result that once or twice I thought I had a fit, and then after a few weeks the entire thing had to be made over. I had used this method in several other cases and it suddenly occurred to me that this was exactly the case where I needed it. The first time I used this technic, unfortunately not as thoroughly, but an approximation of it, I placed in that patient's mouth a plate that stayed. He is wearing it today, an upper gold denture, with the only modification of replacing the teeth in the upper denture in an absolutely correct anatomical relation. This will allow a deflection of the soft tissues, just as much as it is necessary to deflect them in order to have the harder portions receive their share. This has been driven home to me in the making of saddles, but I use no anchor in denture work. If I attempt to take a plaster impression of the saddle I wish to use, I fail every time, and the result that I obtain in taking a modeling compound impression, using this technic, is best. Then placing this saddle as I outlined yesterday, properly made, over the impression, it is the only way I get a saddle that admits of no resorption under the stress of mastication.

I want to speak of one or two points brought out in the paper. One was the attention to the definite detail of the technic. In taking plaster impressions we usually fiddle around in our impression tray drawer to find a tray that is nearly right, slap in a little plaster, push it to place, make a model, or rather, trim the impression first and then trim the model, and then we make the denture. We have no definite knowledge of the amount that we can trim any portion of that model. We have no moral right to trim a model if the model we have obtained is taken from an impression properly made. I want to speak on this attention to the detail of any technic that may come in our dental work. I do not care what the thing is we are going to do, there is a right way to do it, a definite technic. There are certain details that must be followed, and worked out to perfection, and unless we are willing to take every step as it was given today, and follow it out to the fullest extent, we are going to fail in a measure in our results. Dr. Dahan, of Chicago, makes, or has made—he is, unfortunately for the profession, retiring at this time—some of the most beautiful gold and continuous gum restorations it has been my privilege to see. He swages his rim. How? By simply being able to get an impression by this method, and he has every outline of his plate line, since he gets his impression, and he simply carries it over and swages his rim. It is beautiful work, and he told me a year ago that he had yet to trim one of those cases on account of inattention to the muscle attachments. I haven't discussed this paper or essay at all, but have simply added my word and observation to the use of this method. I do little or no plate work, because our cases come to us usually with a few teeth, and it is necessary to conserve those. But I do know that it is just as important to take the impression of a saddle that I wish to use in this method as it is to take the impression of a denture in the mouth. I want again to compliment the society on this splendid way of showing the definite technic for this method.

Dr. N. S. Hoff: I think everybody should be on his feet to discuss this paper. It is one of the things that is most illy done of any technical operation in our profession. I heard a gentleman behind me say he didn't like to do this thing; he said he hated it. But we must all do it. Here is this old lady, eighty years of age, who has lost all of her teeth, and has nothing to chew with, and who shall say that she has no right to have as good teeth as the rest of us? Some one has said that we dentists are exacting money from people for artificial teeth so that our patients can chew more food than they are entitled to have, and that this increases the high cost of living and gives such patients indigestion from over-eating. He asks, why should we give them teeth when Nature was depriving them of their natural teeth? Nature does not think they needed anything to eat.

A few men, like Dr. Giffen, are doing dental prosthesis right and are giving as much time and attention to developing the proper technic for it as the rest of you do to your gold inlays, removable bridges, etc. Some one back of me suggests that he didn't have any equipment in his laboratory. Well, I want to ask, why haven't you the equipment? You should have it. If you will visit nine-tenths of the offices in this state you will find the laboratories either in a closet or in a dark room—the poorest room in the place. If you look for an impression tray, you will find a sorry lot that look as though they had been through the Mexican War, and a cigar box filled with worn-out tools, and that is about all there is in the laboratory. How can one expect to develop a proper prosthetic technic under conditions of that sort, or what incentive to attempt a good piece of work, when you hate plate work and do not want such patients to come to your office? How can anyone develop a technic such as has been shown here under such conditions? I wish we had a Dr. Hunter to awaken us on this prosthetic duty, as he did on the infection problem; we would certainly get busy and develop a proper technic.

I have said before that modeling compound, even though it may be the most perfect modeling compound made, is the poorest material we have to take impressions with, simply because everybody thinks it is so easy to take a modeling compound impression, that no particular care is required, or that any modeling compound impression is good enough. I rescued from a dental laboratory an impression which I kept to show my students as an example of how not to do it. There must be three or four cakes of modeling compound in it. How the dentist got it in and out of the mouth I do not know. There must have been a big mouth or a lot of loose tissue, or possibly he performed some kind of a surgical operation to remove it. It not only took the form of the inside of the mouth, but it took the whiskers on the outside.

When a man like Dr. Giffen has taken the pains to develop a technic like this, and gone to the expense of showing it to us in such an impressive way as has been done this morning, with these beautiful pictures, much credit should be given him. The only criticism I have to make of the pictures is that someone should have been around to crack a few jokes, and have a little more life in the countenances of the actors. They all looked so solemn that I didn't know but that Giffen was going to rob the patient.

I know modeling compound impressions can be taken so that they are good. Modeling compound impressions, however, are not always or usually taken with this careful and definite technic, and that is the reason they are not good. Modeling compound impressions, taken with an excess of material and with poorly-fitted trays, are an abomination. Modeling compound, when a mass is used, never stops flowing as long as it is in a plastic state; it is always moving away and you cannot get as accurate an impression with modeling compounds as you can with some other materials when it is used carelessly. Even when you are not making pressure on it, it is flowing away from the surface, and if any undercuts of any sort are present, you cannot take an impression with modeling compound and withdraw it without injuring the tissues or breaking the hardened impression itself, which is impracticable where you have a large mass of material to deal with. If we are going to take modeling compound impressions at all, they should be taken with the same care and exactness as has been demonstrated this morning. Otherwise, use plaster or beeswax, or any other material, in preference to modeling compound. Do not depend on a modeling compound impression where it is used in a large mass. The whole secret of success lies in the fact that only a limited amount, or just the exact amount, of impression material is used that will give the form and detail of the impression. This is the whole secret of Dr. Giffen's technic. He didn't make it emphatic enough to suit me. I want to emphasize this idea and make it most emphatic, because that is where the success of this operation lies. Some one wants to know if we could take partial impressions with compound. You can, but it is more difficult. You can take them better with other materials. I can take, with other materials, just as good impressions as Dr. Giffen can with his modeling compound, but as this is not pertinent to the presentation, I shall not discuss it now. If you intend to adopt this system of taking impressions, you must do it with the same definiteness and the same amount of care that Dr. Giffen has shown us here in these pictures. He has not overdrawn this matter at all. I know he is telling us just exactly what to do as well as how to do it, and not a single thing we haven't got to do, in order to be successful in securing accurate compound impressions. It cannot be done with badly fitting trays, with excess of material, or with carelessness in the handling of the material. It requires the same kind and degree of care that we have seen on the screen. And why shouldn't we use this care? We use the same kind of care to make an inlay or crown for a tooth, and isn't a complete denture for this fine old lady, who behaved so well for us, a service worth while? Isn't it worth as much to construct a denture and restoration, which will be a joy and pleasure to her all the rest of her life, as it is to make a gold inlay for our best patients? I think it is worth a great deal more, because almost anybody can make a gold inlay or even a removable bridge, provided they are sufficiently skillful and give attention to details. Why should we not give the same degree of attention to this branch of our work? In truth, if we learned to do this work with the same amount of skill and detail, we should enjoy it and do it as carefully and as willingly as we do any other form of service. We need to be stirred up as a profession about this thing, and if we do it satisfactorily, if we use a reasonable amount of care and detail with it, our patients will be so appreciative that the compensation for it won't be any more of a question than the compensation for the most exquisite service we render in any department of the profession.

Dr. Hildreth: I want to take issue with Dr. Hoff. I am reminded of the cockney Englishman who was secured to take part in a Roman holiday in London. They had hired this young man, who had a fine physique, and they had togged him out in full Roman regalia, and he had traveled about the city in parade, for a number of hours. Finally they came to a stop on a corner where an old lady was standing, and her curiosity was aroused. She walked over and looked at the young man, looked him over carefully, and said, "Are you Appius Claudius?" He said, "No, ma'am; I'm un'appy as 'ell." My name being Claude, that fits my case, when it comes to speaking. But I want to make this suggestion: Dr. Hoff said every man practicing dentistry should take an interest in prosthetic work. We all know, if we are conscientious, that part of dentistry in which we are strongest. I made the suggestion to Dr. Hoff that a paper be prepared on the subject of specializing in dentistry. It seems to me that the day has come when dentists, in the city particularly, should specialize in dentistry, the same as men are specializing in medicine. Some men are strong in crown and bridge work; they should confine themselves to that which they are most efficient in. It is best for themselves, for the public, and for their clientele. I believe the dental profession of the state of Michigan should be educated in this respect, and they should be brought to the point of specializing. And the public must be educated as well. Many men who are practicing dentistry know they are not proficient in plate work; they know they are not capable in that line. Where one man may be capable in plate work, perhaps his friend across the street may be even more capable in operative dentistry, and if we would get together and pull together, and be educated to the point where we would co-operate, we would help ourselves and help the public.

DR. GIFFEN: I am glad you have received this in the spirit in which you have, and hope it will help some who have been troubled along this line.

DR. HOFF: It is an unusual thing to have a man go to the expense of presenting a thing in the manner in which this has been presented, and I want to move a vote of thanks by this association for the presentation to this association of this very interesting and instructive demonstration.

Motion seconded by Dr. Hildreth and carried.

DISCUSSION—NORTHERN OHIO DENTAL SOCIETY

DR. GEO. H. WILSON: We, this association, may congratulate ourselves upon having the pleasure of listening to such a valuable paper. Those of us who know the mental trend and technical ability of the essayist expected nothing but good ideas, well expressed. If the paper had consisted of a lot of platitudes there would have been nothing worthy of discussion; but a subject presented in so pleasing, instructive and convincing a manner is certainly worthy of consideration.

The paper as a whole is to be commended, and made use of in practice. However, this does not signify that it is to be adopted to the exclusion of other methods; but it does imply that the methods detailed have a value, and should be well studied and comprehended. One trouble with us as a profession has been, and not yet eradicated, that we are too empirical in our practice. We are too much inclined subconsciously to argue that if a thing is good and especially if new, it should be used in every place; whereas it should be given scientific consideration and used when indicated—because it will meet certain existing conditions. That is just the way the method described should be used, that is, where indicated.

The question naturally arises, where is it indicated? The paper implies and your discusser knows that there are many who believe it is indicated universally to the exclusion of plaster methods, or, at least, that plaster is very, very rarely indicated. Whereas, it is the opinion of your discusser that the reverse is the truth; that is, that plaster methods are almost universally indicated and that modeling compound is rarely advisable.

To explain this statement it is necessary to call attention, hastily, to some of the physical properties of plaster of Paris and modeling compound. Plaster is inflexible, and easily fractured. Compound is flexible but has little elasticity and does not break readily at body temperature. This non-breakableness of compound is the property that especially commends it to many operators, whereas it should condemn it, because this property makes the material very deceptive. A fractured impression can be adjusted, whereas a distortion by bending is not easily detected, nor corrected.

Another physical property of the two materials to be considered is that of expansion and contraction. In setting, plaster expands and compound contracts. The slight expansion of the plaster is an advantage in impression taking, because it slightly decreases the mold, thereby causing a closer adaptation; whereas the compound contracts on cooling, thereby slightly enlarging the mold. Someone is thinking that the expansion of plaster causes a bulging of the vault portion of an upper impression. This is true, and this specimen, which will be passed about the room, shows it; but this bulging is a known factor and easily controlled by suitable technic. However, the bulging caused by the expansion of plaster in the cast (often erroneously called model) cannot be so readily controlled; therefore Spence plaster compound should be used for the cast, which gives four to six times the strength and stability of plaster.

Another consideration in favor of plaster and to the detriment of compound is the comparative simplicity of the one and the complexity of the other. The one is positive and the other is negative. For successful results the one requires almost no assistance of the patient, while the other is quite largely dependent upon the active help of the patient; and any technic method that requires the assistance of the patient is defective to the extent of the assistance required. There are many patients of whom it is very difficult to get them to do as the operator desires. Further, the equipment for proper manipulation of compound is quite cumbersome, that is, it requires hot and cold water, and a small flame. These should be as conveniently near the patient as a table can be placed, for the time the compound is at the right temperature is exceedingly short and there is no time to run from the laboratory to the chair; in fact, for the more delicate manipulation of the material there is hardly time to turn about. The temperature at which it should be worked is about 140 degrees F. and a material that has the property of absorbing as much heat as the resinous compound used is very close to the uncomfortable state. It is a skillful operator indeed who will not sometimes get the material into the mouth so hot that it will jar the confidence of a sensitive patient; also the comfortable fee to which the essayist referred. If the operator does not use this comparatively high degree of heat he does not get the results of which the material and the method are capable.

This impression method known as the Dr. Greene method is not suitable for teaching to a freshman class in a dental school and your discusser knows of no experienced college teacher who would dare to present it as an every-day method. However, it is well adapted for post-graduate teaching and has a valuable place in the hands of experienced, capable and thinking men.

Where is this method indicated? In all places in which the operator has failed for unaccountable reasons to obtain satisfactory results. Why is this method useful for such purposes? Because it is the only method by which a tested impression can be produced. The method is a "cut and try" one. That this is so you are referred to the demonstration of the evening in which one of the simplest cases, for the use of compound, was used; whereas in difficult and complicated cases it may be necessary to insert the material from fifteen to twenty-five times, and it requires an expert technician for these delicate and difficult operations.

There are many modifications of the Greene brothers' method taught as the methods of various teachers; they are all based upon the original method and the honor should be given where due.

Personally, I desire to say that I believe Dr. J. W. Greene has done more toward teaching the underlying principles of impression taking than any other man now living. However, this does not imply that he should be followed in detail, but the principles underlying his teaching must be used with whatever material is being manipulated.

METAL CORES FOR CASTS

This method is a very questionable one and its relative value could only be determined by tests. It is doubtful if the method is equal to the Spence plaster compound method.

No man's opinion is worth the breath expended in uttering it unless that opinion is backed up by exhaustive and conclusive physical laboratory tests, and that supplemented with practical dental laboratory experience.

In closing, we again wish to congratulate the essayist upon the splendid presentation of valuable methods. We know his ability, enjoy his modest enthusiasm and are grateful to him for his instruction.

Dr. A. F. Miller: Not having given my special attention to the subject of this splendid and instructive paper in my practice within the last few years, I do not feel fully competent to discuss it intelligently. I fully realize the importance that the profession, or, I might say, the general practitioner, is the one most benefited by these thorough, concise principles so clearly presented by the essayist to you here this evening. Much of the uncertainty of getting a perfect adaptation of the denture is removed from the mind of the painstaking operator, if the technic is carefully carried out. The plastic materials used as indicated in this method, in my opinion, make it possible to get a correct impression and are superior to plaster, getting relief on the hard tissues and greater pressure on the soft tissues where desired.

DISCUSSION—OHIO STATE DENTAL SOCIETY

Dr. A. J. Bush, Columbus: We appreciate the honor of having Dr. Giffen with us this afternoon and we regard it as a privilege to hear his able paper upon what he deems the most important subject in the whole field of prosthetic dentistry, namely, the basic principles involved in the construction of artificial dentures.

I consider it a distinct honor to discuss Dr. Giffen's paper, and will make it known now that I have no criticisms to make or any discouraging remarks to offer. The only ambition I have in discussing this paper is to make an attempt to show my appreciation of Dr. Giffen's effort to give the profession a system which he is convinced has scientific possibilities. It occurs to me that his description and demonstration of the technical procedures, step by step, should in itself furnish sufficient incentive to the average dentist to do more efficient work in this field through sheer love of pursuing a method fraught with unlimited possibilities, which will give us the means of becoming intelligent masters in management of so many troublesome details.

Dr. Giffen makes no claims to originality, yet he has done original work by selecting the best points from various methods and very ingeniously arranging them into one harmonious chain of technical procedures which has yielded a beautiful system that indeed offers something new to think about.

This method recommends itself to me chiefly because of the fact that all the details of plate construction are under the most intimate supervision and their management correspondingly under more direct control.

Since I first became acquainted with the essayist's technic of taking impressions, management of model-making and the production of trial plates, I have arrived at the conclusion that the ordinarily so-called well-fitted plate is the result of painstaking care only,-and may in a sense be regarded as a mechanical coincidence. I welcome the technical procedures and methods described by the essayist this afternoon as offering a truly scientific solution for many difficult problems that have confronted practitioners in this particular field of dentistry since the art of artificial denture construction has been practiced. This seems to be a system which I am confident will prove, upon fair trial, within the capabilities of the average painstaking practitioner, and I see no reason why this method should not render it possible for us to do better work by virtue of being able to more accurately control the many mechanical details, which, when under direct and intelligent supervision, should render it possible to produce a truly scientific result and likewise remove plate construction from the field of guess work.

The latter statement is made with full knowledge of the imperfections of ordinary methods, in proof of which we may point to repeated failures that have occurred in spite of painstaking care, and which indeed seems to be so frequent in the practice of the average plate worker that I am prompted to say that plates that are apparently satisfactory may be regarded, in the absence of scientific control over the basic detail underlying their successful construction, as mechanical accidents. Or, in other words, I believe that these failures mentioned are the result of following methods that permit errors to creep in unknowingly and result in misfitting dentures in spite of the fact that we may be making special efforts to achieve extraordinary results, while in other cases the same methods yield satisfactory results with no manifest difference in the execution of the mechanical procedures. Invariably when these failures are encountered we contribute them without hesitation to faulty impression. It is self-evident that no prosthodontist would knowingly construct a plate over a model yielded by a faulty impression. Still, if ill-fitting dentures do occur, and I believe they occur quite frequently, it is obvious that some of them must have been constructed over models cast in imperfect impressions. It must follow, therefore, that these faulty impressions were regarded as perfect, first because the fault was not visible, and second because the error could not be demonstrated. While it is within the range of possibilities that the model might have been responsible, yet I believe it is a safe assumption to lay the blame for ill-fitting dentures, in the majority of cases, at least, to imperfect impressions.

It seems, therefore, that the ability to demonstrate the perfection or imperfection of an impression, as far as the test of absolute adaptation is concerned, is sufficient reason in itself for adopting the method recommended by the essayist for taking impressions.

The additional advantage that the method offers for muscle trimming which ordinary methods do not possess to any great degree at least, and in the absence of which displacement would occur even in perfectly adapted impressions, seems to constitute a second reason for using this method. A further advantage is gained by being able to use a metal trial plate, no less perfect than the perfectly adapted muscle-trimmed impression which has stood the tests prescribed by the essayist, and seems to be a third reason for using this method.

In what he terms as the second step, the essayist describes model-making. While in pursuing this method two models are made, the first of which is used in performance of the preliminary procedure of impression taking and then discarded, I see no reason why the cored plaster model will not answer all purposes as the most expedient material for use in this capacity; yet it seems for the sake of scientific accuracy that it is not best to emphasize the employment of plaster of Paris in connection with the core in the making of the second and permanent model over which the vulcanite plate is to be constructed.

While I do not care especially to discourage the use of plaster of Paris for models, for it is an expedient material for such use, and has been used with varying degrees of success for so long that it seems to be inseparably associated with this part of our work; and while I am mindful that in this regard I may be living in a "glass house" myself, still, while we are considering scientific model-making, as a matter of principle, I wish to call attention to the unreliability of this substance and direct your attention to a material that Dr. J. H. Prothero demonstrated in the clinic which he gave at the National Association in Rochester. I refer to magnesium oxychloride. In this clinic he exhibited plaster casts of ordinary composition; plaster casts hardened by boiling in a saturated solution of borax and water; plaster casts hardened by boiling in stearin; magnesium oxychloride casts which had been subjected to the vulcanizing process once together with the base plates vulcanized on the same.

In this clinic he called our attention to the fact that the setting of plaster is a chemical process of crystallization; that the crystals are long, thin, needle-shaped and brittle; that they have no regular order of grouping but lie indiscriminately against and over each other; that many spaces exist between the crystals; that not only these spaces but many minute air spaces as well are present on a surface and throughout the body of the cast; that under excessive stress as in the case of forcing together an over-packed flask the surface crystals readily break; that saturating or boiling the cast or plaster in any form in water as in closing flasks the surface crystals are softened and much more readily crushed and distorted than when kept in a dry state; that such distortion of the surface of the cast and matrix as well leads to misfitting dentures; and that the remedy lies in exercising greater care in packing and closing flasks and in the use of harder and more resisting material than ordinary or untreated plaster for casts.

Dr. Prothero further stated that plaster surfaces may be hardened by boiling in a saturated solution of borax in water for about two minutes. When this is done a superficial hardened shell of about one-sixteenth inch in depth is formed which enables the surface crystals to withstand greater stress than will unprepared surfaces.

He further stated that casts may also be hardened by boiling for about five minutes in stearin, and claimed that the surface crystals of plaster so treated are strengthened materially.

Regarding magnesium oxychloride which is the result of combining magnesite MgO with a saturated solution of magnesium chloride; Dr. Prothero claims that this combination results in an extremely hard, smooth surface, capable of resisting heavy stress; and further claims that this material when combined with from 50% to 80% of clean sand produces a very dense hard product, closely resembling stone; and that from the standpoint of density, smoothness, resistance to stress and minimum dimensional change in setting, there is no equal for the construction of casts for vulcanite work. In using this material for models in connection with modeling compound impressions, he recommends that the impressions should be given a light film coating of sandarac varnish.

In this clinic Dr. Prothero also gave his findings of compression tests performed on plaster blocks and magnesium oxychloride blocks. The area of the compressor plunger used in the test was ¼ inch. The blocks that were tested were 1½ x 1½ x ½ inch. According to his findings the plaster cast withstood stress up to 20 pounds beyond, which the plunger began sinking into the block; and under a continued gradual pressure the plunger was driven in to a depth of about ⅛ inch, when the block crushed, the indicator recording 100 pounds' pressure. Tested in the same way, the magnesium oxychloride blocks showed no perceptible compression up to 1,000 pounds, at which point they suddenly crushed. In addition to this he reported a test made by Major Q. A. Gilmore, U. S. A., with oxychloride of magnesia, combined with a large percentage of clean sand, which showed a still greater resistance to crushing stress, blocks 1 x 1 x 1 inch dimensions standing up well under heavy loads and crushing at approximately 5,000 pounds. He also reported his findings on the resistance of this material to breaking strains, and the results were in favor of magnesium oxychloride in about the same ratio.

In testing the expansion of these two materials he found the expansion of magnesium oxychloride to be about one-fourth that of plaster.

While the method of making models of plaster of Paris in connection with a metal core as advocated by Dr. Giffen undoubtedly overcomes the objections to plaster as ordinarily used, and the slight change in surface form of models made in this manner may be so minimized as to not appreciably affect the fit of the plate and therefore is vastly superior to the methods of model-making used ordinarily, yet I wish to call attention to the excellent properties of magnesium oxychloride and simply offer the suggestion that it might prove to be a valuable material for use in this connection.

I wish to compliment Dr. Giffen on the modern twentieth-century manner in which he has chosen to present his subject, and also to record our appreciation of the unselfish generosity manifested in the highly edifying demonstration which we have had the pleasure of witnessing this afternoon.

Dr. W. A. Giffen (closing): I wish to thank the discussors of my demonstration. They have treated me very courteously, I am sure. I did not expect Dr. Wilson would agree with everything I had to offer, but I feel certain that the time is not far distant when he will arrive at the conclusion that more accurate results can be obtained with compound than with plaster.

Dr. Wilson made the statement that compound is deceptive because it is flexible and does not break readily at body temperature. The doctor is perfectly right if you use it at body temperature; but I have endeavored to show you a suitable technic so you may chill the compound far below body temperature which I assure you is very simple, and in fact is the great secret in using this material effectively. I am satisfied that practically no change takes place in compound after it is chilled.

I was very glad to hear Dr. Wilson pay such a nice tribute to Dr. J. W. Greene, viz., that the principles underlying his teaching must be used with whatever material is being manipulated.

Dr. Miller asked a very important question about the relief of pressure on the hard palate. I assume that he had in mind those cases where the ridge is prominent or spongy. I believe that resorption takes place more slowly under a denture fitted in this way, further, that when resorption does take place to the extent of making a denture a misfit it should be refitted to meet the conditions; however, there can be no more objection for relieving pressure of a plate made from a compound impression than from a plaster impression.

A MEMBER: What price did you get?

DR. GIFFEN: A dentist should do his best to obtain the most perfect result in a given case. Whether he is working for his maximum fee, his minimum fee or for sweet charity's sake should make no difference.

COMMENTS ON PREPARATIONS FOR THE RECEPTION AND TREATMENT OF PATIENTS *

BY GILLETTE HAYDEN, D.D.S., COLUMBUS, OHIO

IN PRESENTING A PAPER under this title it is my chief aim to offer suggestions to the newer members of the profession as to the preparations to be made for the reception and treatment of patients. When we think of the essential features that go to make up the dentist's environment, they naturally group themselves under two headings: General and immediate surroundings. The tendency of the average dentist is to be content with what he calls "good enough" in both his general and immediate environment. He is more than apt to be satisfied with much less than a fitting and adequate setting for his professional vocation. In this he is at fault, because all of us know and recognize the fact that to the professional man the expression of his individuality in his surroundings is more essential than it is to the man in commercial pursuits, and of all professional men the dentist has the greatest need of care in this respect. His is the one profession which requires that his business shall be conducted within his offices, therefore how especially important it is that he be vitally concerned in the selection of his surroundings. Instead of allowing his environment to be a drawback to him, as is so often the case, because of carelessness or indifference to its importance, the dentist should seize upon and make the most of its distinct value, because in his office he is found in his normal setting, and he therefore may appear to the best advantage.

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*Read before the Michigan First District Dental Society, 1914

I put especial stress upon this environment idea because probably the majority of us fail to recognize how fully our environment bears the stamp of our own characters, and how surely the individualism of each of us is apparent in the choice of location of the office, in the type and color of decorations, in the furnishings and their arrangement, and in the equipment. All grades of harmony, or inharmony, order or disorder, convenience or inconvenience, system or lack of it, are displayed in our various offices for everyone to recognize and interpret according to the degree of his powers of analysis.

If, in what we have chosen to surround us, we fail to show the fulness of our qualifications for our true place in the ranks of efficient workers, the difficulties of overcoming the effects of this deficiency are overwhelming. The absence of an *obvious presentation* of our preparedness to meet the requirements of the place we actually occupy in our profession, is sufficient to prevent us for years from becoming known by more than a few of those who rightfully comprise our world.

It may be true, that, "If a man can write a better book, preach a better sermon or make a better mouse trap than his neighbor, though he build his house in the woods, the world will make a beaten pathway to his door," nevertheless the dentist who makes the pathway to his door easy of access, and the door itself invitingly attractive, and who presents himself to his clientele in harmonious and pleasing surroundings, has already established his claim to a definite rating in the minds of prospective patients.

Every person intuitively seeks the services of a dentist whose environment is congenial to him, and therefore one in which he feels comfortable, counting upon the surroundings being representative of the dentist, and the dentist representative of his surroundings. This very natural method of selection affords protection from embarrassment to both dentist and patient, and brings again to the attention the obvious advantages of preparing for a definite type of clientele by means of a setting which is indicative of that same type of professional man or woman. You may ring false or true in your setting according as you are in or out of harmony with it, nevertheless by the surroundings in which your patients find you, are they prepared for you yourself. Reach out ever so little even beyond the confines of the stratum to which you belong, and show a desire to surround yourself with the things which speak of progress and development, and in response to your growth and the demonstration of it, will come desired opportunities and the opening of doors heretofore closed. You owe it to yourself to present yourself and your services to your clientele in the most favorable light.

In those practices where the services of an office attendant are indispensable, much responsibility rests upon her, for through her interested and intelligent reception of a patient another impression is stamped upon the mind. She it is who first makes the patient aware of the attention and consideration that characterize a particular office. Let a person be greeted by a cheerful, interested office assistant and an air of attentive concern is expressed, and the unconscious thought of the patient is, "I am going to be taken care of." An office girl's commonplace, uninviting, "What can I do for you?" or the equally disinterested queries, "What do you want?" and, "What is it?" spoken in a tone of lusterless quality and with a disinterestedness which says, plainly, "I ask merely because I am paid to," throw a chill of anxiety into the mind of a newcomer. He immediately wonders, "Am I in the right place after all?" and looks about him for assurance that he has made no mistake. Inquiries can so easily be expressed in words which are agreeable, and in a manner intended to convey the spirit of kindliness and thoughtful courtesy which is always to be met in that office. "May I ask whom you wish to see?" or, "You wish to see Doctor H——?" asked in a pleasant, information-inviting manner, followed by, "And what name may I give?" meet with a ready response. One of the most welcome and satisfactory methods of gaining the desired information from a person calling for the first time, is to present him with a little card on which there is space for answers under these headings: Name, Address, By Whom Referred, and Nature of the Call. By requesting callers to supply the answers, the needed information is given with no chance for mistake. With this knowledge in his possession, the dentist finds it more pleasant and satisfactory to greet the newcomer. Much can be said in approval of this method.

Those patients accustomed to visiting the office by appointment find it agreeable on arrival to learn from the attendant that the dentist is ready, or will be ready in a given time. There is nothing more exasperating than to sit in a reception room wondering if the dentist knows you are there, and speculating on how long you will have to wait. That form of discourtesy ought never to be permitted. There is scarce anyone who has either the time or the inclination to sit and wait indefinitely.

The telephone offers many opportunities for the attendant to show her pleasantness and tactful interest, and this is one instrument in the office equipment so often unintentionally used to a disadvantage. We seem not to realize that what is said, and the way in which it is said, carry much weight over a telephone. It is not easy always to remember that the ears of the listener take note of every detail of word, and voice, and manner, and that the mind of the person receiving the message is entirely dependent upon the faculty of hearing for its interpretation of a conversation. Even though no conscious thought be given by a person to the pleasantness and satisfactoriness of a telephone conversation, still the impression is registered, and the mind unconsciously expects and anticipates the same courtesies whenever such a call is necessary. Doubtless it is quite possible for each of us to recall some particular office where the attendant is especially skillful in her management of telephone calls.

Wherever she is found she is an asset of no meager influence, and her training for this duty should not be overlooked.

We are so apt to think of the attendant only as one who relieves the dentist of the very minor cares of a practice, one who assists him at the chair and who takes from his shoulders the burden of small things which do not require special attention. We are so likely to begin practice with this opinion and so liable to drift along in this belief, that we fail altogether to note the possibilities of the position of office attendant, and we forget that generally the housekeeping of the office rests upon her. Very often, too, we overlook the fact that the attendant herself has seen the opportunities open to her and has quietly assumed responsibilities, the performance of which are important to the welfare of the office. Does it not seem worth while to over-estimate rather than to under-estimate the importance of her place in the office in consideration of the skillful management required to perform her duties creditably?

Three methods are in practice for providing time for the examination of new cases: *First*—The haphazard one of breaking in upon time already allotted by appointment to another person; *second*—that of setting a definite hour at some future time for each individual wishing examination; and *third*—that of setting aside a given time each day for the consultation hour. The first method is undesirable and unnecessary in a city practice except in rare instances; the second and third each have their advantages and advocates. The second method, that of setting a definite hour for each individual, is the one most suited to a one-man practice, for it allows the dentist the necessary time for each examination without requiring him either to filch the time from some other appointment, or to lose any of his working hours waiting for a possible newcomer. The third method, that of providing a definite consultation hour each day, is a very convenient arrangement in a practice where two or more dentists are associated, and where each one can serve his turn in keeping the hour.

In readiness for the reception of a patient into the operating room, cleanliness, order and arrangement are especially essential for the accomplishment with dispatch of the work to be done, for the comfort and safety of the patient, as well as the operator.

There is a mental rest and a sense of security conveyed to each patient by the fresh linen for head rest and for protection to the clothes, by clean opal glass top bracket-table and cuspidor, fresh glass for warm water in the water heater, sterilized instruments and fresh dental waste receiver; by aseptic napkins for removing debris from instruments instead of using the towel covering the patient for that purpose; by a floor unlittered by a shower of cotton pellets, discs, strips and debris that belong in a waste basket, and lastly, by clean hands. The care and thoughtfulness displayed for the comfort and safety of patients is made so obvious by these signs that any apprehension they may have held previously as to these details is immediately removed. An element of comfort is added by the presence of fresh air minus any odor of medicines and perfumes. Is it not certain to be more agreeable to all concerned for the operator to use unscented toilet soaps? Is anything more annoying than an odor on hands or clothing of the operator which is disagreeable to sensitive olfactory nerves? No matter if the odor be of the French perfumer's art, an essence which pleases one person may not meet with another's idea of a delightful fragrance. The safest course for the operator to follow is to be sure that there is no cause for discomfort for patients in the operating room through the presence of odors of any kind.

In the further consideration of cleanliness and comfort, the upholstering of the dental chair comes in for its share of comment. Men may not realize how thoroughly unlikable a plush covered chair is, but aside from the uncleanliness of it, the uncomfortableness of it is enough to make every woman want to shun it. Plush chairs and cloth dresses are too tenacious of each other to be likable in combination. When comfort and cleanliness are to be considered, there is but one choice between plush and leather covered chairs.

When designers and manufacturers of dental chairs have been to such pains to produce a piece of mechanism that is capable of adaptation to the various heights of people, and to the intervals between the locations requiring support, it does seem as though we, the users of these chairs, should exhibit some thought in the adjustment of them so as to give the maximum amount of comfort to patients. During long sittings of an hour or more a readjustment of the back and head rest of the chair often prevents excessive strain on the patient's endurance, by giving a slight change of position to the body which is very welcome. Even so little a thing as the location of the cuspidor can add to the comfort of the patient. By placing it just in front of the left arm rest instead of to the left of the center of the arm rest, it is more easily acessible, because a bend of the body forward is more comfortable than a twisting bend sidewise.

If all the steps leading up to the actual examination of a patient's mouth have been painstakingly observed, a definite set of ideas will have been firmly implanted in his mind, which prepare him for and lead him up to his final decision when the examination is complete.

With every detail of the reception of the patient into his operating room the dentist displays some phase of his type, or some one of his characteristics. The attentive interest shown by the office assistant in the reception room is repeated by the dentist in his attitude of greeting. If the card system before mentioned has been used, the way has been made easy even for those who have found it difficult to open a conversation—"Mr. Smith, I am glad to make your acquaintance. Your card of introduction tells me that you are in need of help." This or some similar greeting opens the conversation, speaks of the dentist's interest in the individual case, and offers the patient the opportunity to give any further information concerning his case that he may wish. Then, "Won't you be seated and let me try to find out just what is needed?" After adjusting the chair, why not ask if it is comfortable, and if the head rest is at the proper angle? This serves two purposes—that of placing the patient in a comfortable position, and that of avoiding the necessity of asking him to lean back in the chair.

Beginning with the examination, is it not wiser, and safer, too, to invite the co-operation of the patient by encouraging him to give all the help he can toward making the operation as easy as possible? Just at this point we realize how wise it is to avoid a prolific method of producing uneasiness and apprehension at the start, that is, the all too common custom of gripping the patient's head in a vise-like left arm, with the mouth exposed to view by the stretching power of a mirror in the left hand, while the right wields an exploring point without the precaution of using a finger rest to guide it. This unwarranted grasp of the head will put ninety-five out of every hundred patients on the defensive immediately, whether they recognize the fact or not. From a defensive attitude to a rebellious one is not a long step; apprehension grows into fear like magic, and the patient is ready and waiting for pain to strike him the next moment. All this and not a stroke of work done yet! Is it any wonder that we meet with a terrifying fear of the dentist so often, and that these patients eye us with suspicion and anxiety until we prove ourselves to them? We need to realize to some extent the cause of this fear and to meet it with intelligent understanding and sympathy, for we gain little by ignoring it.

Is it not easier, and more pleasant, too, to encourage every spark of confidence and all the co-operation possible by holding the mirror and explorer in a firm, sure, yet light grasp, and have finger rests to make them both secure, than it is to engender dread by every thrust of an instrument used with a free arm movement? Nothing so surely establishes confidence in an operator's skill as his ability to make his patients feel secure from slipping instruments and safe from unnecessary pain--and there is little that is more promptly and gratefully received by a patient than a true interest in his case.

Some mention of a few things which a dentist must be prepared to consider while operating, and to have regard for in concluding an operation, may not be amiss in this discussion.

Frequently we are called upon to treat a case when, from chapping or from fever blisters, the condition of the lips is such as to preclude the possibility of operating without great discomfort to the patient, or actual laceration of the tissues, unless some emollient is used. I feel that it is a privilege to suggest in these cases the use of Phenlin Oris, a preparation after the formula of Dr. D. D. Smith. Nothing has given me more continued satisfaction or greater comfort in making it possible to operate under these conditions, and I feel that this agent is so worthy of your attention that I cannot refrain from mentioning it. It is little short of barbarous to attempt to place a filling or to perform any other operation without the use of some softening agent on lips that are cracked from long continued chapping. The application of this salve to the lips before placing the rubber dam adds greatly to the comfort of the patient, as it will also if used around the neck of a tooth on which a clamp is to be placed.

Most dentists are careful to place cotton under the rubber dam holders to protect the face, but often little attention is shown in the adjustment of that portion of the rubber covering the upper lip. Often the width of this strip is so great as to cover partially the nostrils, making breathing difficult, and adding greatly and unnecessarily to the discomfort of the patient. Little aseptic napkins placed between the chin and the rubber offer great relief from the feeling of moist untidiness which is so annoying. When the rubber dam is to be removed, it can be quickly and deftly done if the sections of rubber between the teeth are cut with small scissors, before removing the holders. Then as soon as one holder is released the whole piece can be withdrawn without that disagreeable pulling and snapping of the rubber as it comes away. The patient feels less untidy by far and appreciates the fact.

After any dental operation a light massage of the gums with camphene or campho-phenique relieves any soreness of the tissues and leaves a sense of refreshment and ease in the mouth. The additional use of a compressed air spray aids in diminishing any discomfort which the operation may have produced.

The prompt selection of the proper instruments needed in the successive steps of an operation, no loss of time in finding each instrument required, and no hesitancy shown in using each one for the definite purpose for which it was selected—all of these things create confidence in a dentist's ability to handle the case, because they speak of a definite line of procedure, a systematic plan through the application of which every move is made purposeful and time and energy are conserved. There is more energy lost and time wasted through the lack of a definite system of procedure in each given case than many can conceive of, until they begin to plan in advance for each successive step of an operation. A mental picture of the cavity preparation and completed filling are necessary before the instrumentation is commenced, if the filling is to fulfill all requirements, and be placed with ease and dispatch.

There are ways of using instruments, means by which finger rests are obtained for sureness and accuracy, methods of securing light and access to all portions of the mouth with the greatest possible efficiency and the minimum amount of discomfort, but these methods are more readily and completely demonstrated than described, and therefore belong rather to a clinic than to a paper.

I have said nothing about the special preparations advisable for the reception and handling of children. This is a subject worthy of great study and consideration, for rarely, if ever, is it possible for the dentist to so dominate a child's mind as to make it possible for him to plan ahead for each operative procedure, unless it be in the field of oral prophylaxis. The child itself is the one who guides and leads, while the dentist, if he is wise, is the one to follow and make the most of the opportunities offered him. A dentist should possess great mental agility, a nimble imagination, an alert and active interest, and an intuitive understanding of children if he is to accomplish much with them. Even though he possess these qualities he wi'l be quite often put to it to choose to do or say the right thing at the proper time. The study of the handling of children in a dental practice is both fascinating and exacting, alluring and baffling. It is a subject requiring a knowledge of children's interests, and intelligent understanding of the child mind, if they are to be successfully cared for. With children, as with adults, a real and abiding interest in the patient himself, as well as in the treatment of his case, establishes friendly relations and helps to create that favorable co-operation of the patient by means of which the most successful dental operations are accomplished.

If success in its fullest sense and meaning is the object aimed at and the goal desired, let each of us remember that the dentist who truly loves his profession desires to give largely of himself and his services toward the relief of mankind. It is this spirit of ministration which prompts his concern and engages his sympathies in behalf of his patients, and which is at the same time his greatest asset and most desirable attribute.

RESTORATION BY GOLD INLAY AND SYNTHETIC PORCELAIN*

BY DR. C. C. COHEE, INDIANAPOLIS, IND.

This is a case of Hutchinson teeth, both superior central incisors, involving from one-third to one-half the teeth. Prepared cavity (lingually) in the usual manner, except used the dove-tail detention instead of the pin or post in canal, as this makes a better retention. While the impression is in place, with a fine, sharp instrument excavate face, making a box-like cavity in impression; cast and set inlay in usual manner. This leaves the front of inlay an open box. With a wheel bur, finish retention, then fill with synthetic porcelain; this leaves a very fine line of gold on either side of filling, the incisal edge somewhat heavier. The thickness of incisal edge will depend on the individual case. In this case, 22k. gold was used.

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*Office clinic, Indiana State Dental Society, 1914.

THE TREATMENT OF PUTRESCENT PULPS AND FILLING OF ROOT CANALS*

BY H. B. TILESTON, D.D.S., LOUISVILLE, KY.

THE SERIES OF PAPERS comprising this symposium, to which this paper is merely an introduction, treat of a department of dental practice which has so frequently been the subject of discussion that it would seem long since to have been exhausted as to its interest to dentists.

But the devitalization of pulps, the treatment of putrescent pulps and the filling of root canals are procedures of such constant recurrence in operative practice, that a discussion of the science and technic involved in the successful handling of cases cannot but prove both interesting and instructive.

A glance through the first three volumes of the *Dental Cosmos* issued in 1860-61-62, shows that the "Ancients" of that time were not as much concerned about the treatment of pulpless teeth as are the dentists of today. In fact, the handling of such cases was not then at all understood, the treatment consisting chiefly in the use of creosote, the apex being stopped with cotton and creosote, the remainder of the canal being filled with gold foil. The decomposition of dead pulps was attributed to the action of oxygen. Even so eminent authority as Wm. H. Atkinson, in writing of alveolar abscess, averred that frequently, though not always, it caused the death of the pulp instead of the converse of that proposition, as we know it now.

Until quite recently the modern method of treating putrescent pulps consisted in immediate removal of the decayed mass with barbed broaches and then drenching the canals with caustic drugs used as disinfectants. Now the management of such cases is largely a matter of chemistry, the putrid pulp being acted upon first by saponifying germicides, coagulants being studiously avoided and the inert mass being removed afterwards, thus avoiding the danger of infecting the tissues beyond the root apex, an accident which frequently accompanied the former procedures.

Putrescence is a condition of moist gangrene, the result of the action upon the organic matter of the pulp body by saprophytic organisms, and it may or may not be accompanied by extra-apical infection.

Just how a highly infected, malodorous and poisonously toxic mass, filling the pulp chamber and canals of a tooth, is tolerated in close juxtaposition to healthy tissues, sometimes for years, is a mystery. It may be that in some instances the apical foramen is hermetically sealed by a blood clot or a calcic pebble, or some adventitious opening may exist about the tooth crown, through which the noxious gases are voided into the mouth, thus relieving a pressure which would otherwise certainly infect the apical tissues. The existence of such a vent, however, is not always observable.

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*One of a symposium of papers read at Kentucky State Dental Society.

Such cases, however, sometimes have been aptly termed "sleeping volcanoes." They may remain quiescent for long periods to be roused into pernicious activity by some disturbing cause and initiate an alveolar abscess. A blow upon the tooth, a sudden thermal shock from hot food, expanding the root content, the breaking of weakened enamel into a cavity, permitting food impaction to force the infection through the apical foramen, or so-called "taking cold," or the unwise broaching of canals at the initial treatment, are some of the things which may disturb the equilibrium about these cases and start an abscess.

The observed tendency to abscess development about teeth containing putrescent pulps upon taking a cold, is explained by the pathologist upon the theory that the diplococcus pneumonia is extremely active at such a time, and attacks the region about the root apex because it represents a *locus minoris resistentiae.*

The first symptoms of a developing alveolar abscess, viz., tenderness to percussion and slight elongation and looseness, are probably not brought about by the immediate emigration of the bacteria from the putrescent pulp into the apical space, but are due to infiltration of poisonous ptomaines into the apical tissues, producing irritation, thickening and tenderness of the pericementum. If the pulp chamber is opened at this stage and its contents sterilized, the incipient abscess is arrested, while if the operation is delayed until pyogenic organisms have become established in the region of the apical space, the abscess will proceed in spite of any subsequent treatment short of complete extirpation of the infected area.

FILLING ROOT CANALS

In filling root canals, two major propositions present themselves for thoughtful consideration. *First*, is it essential only that the apex should be sealed and a matter of indifference whether the remainder of the canal is filled or not?

Second, is the operation to be accounted a failure if a small but indeterminate part of the apical portion of the root canal is left unfilled and the remainder filled perfectly?

As to the first proposition, the liability of the existence of multiple foramina even in single rooted teeth, and the possibility of communication via the dentinal tubules between the pulp canal and the pericementum, make it advisable, at least, to fill the entire root as perfectly as possible.

As to the second proposition, there can be no question but that every root should be filled to the apex when it is possible to do it. Regard for the truth, however, compels the admission that many root canals are so minute as to deny the entrance of the finest broach for any appreciable distance, and if a broach cannot enter a canal it cannot be enlarged, even by the use of sulphuric acid. The filling of a canal with an abrupt bend in it, a so-called tortuous canal, is not practicable. Such a canal cannot be cleaned of its pulp debris, and if it cannot be cleaned, it cannot be filled even with a semi-fluid substance.

All operators, for these reasons, must confess that they have left many root apices unfilled and still they do not feel called upon to admit that all such operations are failures. Experience proves that the majority of such cases remain safe and comfortable if the precaution has been observed to render the contents of the canals sterile by repeated saturation with some penetrating antiseptic.

ROOT CANAL FILLINGS

Another important consideration is the choice of the material with which to fill root canals.

In the quest for the ideal pulp canal filling many materials have been advocated and used.

To fulfill the requirements it is requisite that the material should be fluid enough to permit of its being injected into a canal to its extremity, that it should be in itself antiseptic and that it should be unchangeable as to its composition, insoluble, and should not shrink or contract upon drying out or hardening. It is manifest, therefore, that the first material introduced into a canal must be a fluid or semi-fluid antiseptic, and that this must be followed by a solid substance to force the fluid to the apex and even into the dentinal tubules and to give a firm consistence to the whole.

The fluid portion may be chloro-percha or euca-percha, which is better because of its antiseptic properties, or Blair's Chinosol preparation, that which he calls "Pus-cure," or Callahan's solution of resin in chloroform or any other of the numerous substances which have been recommended for the purpose.

The more solid portion is usually the gutta-percha point. An objection to the gutta-percha point is that in case of very small canals, it is difficult, in fact, frequently quite impossible, to pass it into them at all.

How often, after passing a smooth broach into a constricted canal in the process of pumping in the fluid portion of the filling, have we wished it were some material we could break off and leave there, realizing how impossible it is going to be to get a fine gutta-percha point where the steel broach is. Dr. Theodore Von Beust, of Dresden, Germany, once sent me some gutta-percha points which he had made with a fine silver wire in the center, which served the purpose of stiffening the points most admirably. I was never able to get any more of them, and I do not know that they were ever manufactured for the market.

Dr. L. G. Noel, of Nashville, once recommended the use of a slender thorn or spine which he got from a pine tree growing in Tennessee, but these were never supplied commercially. Some such material which would be indestructible and stiff enough to be forced into small pulp canals would be a great improvement over the gutta-percha.

In this paper I have only sketched the subjects treated of, presenting a thought here and there which may be worthy of your consideration, and leaving the details of technic to the others who are to write upon the several divisions of the subjects comprising this symposium.

DEVITALIZATION AND EXTIRPATION OF PULPS*

BY DR. H. B. HOLMES, LOUISVILLE, KY.

THE SUBJECT OF DEVITALIZATION and extirpation of the dental pulp is quite a shelf-worn one, having been practiced in the profession for more than three score years. This being the case, I will be very brief in my remarks regarding it.

The substance of first choice *used* for this purpose is arsenic trioxid, formerly called arsenous acid. The devitalizing power of this drug was discovered rather accidentally by one Dr. Spooner, of Montreal, Canada, about the year 1836. In his researches for finding agents to obtund sensitive dentin, he discovered that by sealing the drug in a cavity for a few days, the most sensitive dentin yielded to its influence. The fact, however, that nearly all teeth thus treated subsequently gave trouble because of the death of the pulp and the usual sequelæ, led the profession to abandon this agent for the purpose for which it was introduced; but it has ever since been used as a means of destroying the vitality of the pulp; and it may be said today, after more than half a century of experience with it and with other less dangerous but less efficient devitalizants, that it is the substance of first choice for this purpose.

The devitalization of the pulp is a procedure which is oftentimes abused, inasmuch as we believe that a vast number of pulps are destroyed, which might, if properly treated, be restored to normal condition and functionate for years. Far too many pulps are ruthlessly destroyed upon the slightest provocation with perhaps no effort made to maintain their vitality.

The devitalization and removal of the dental pulp is indicated only as a therapeutic measure in pulp diseases which tend to the self-destruction of that organ. It is the plain duty of every dental practitioner to save the pulps of teeth, if it can be done with any reasonable degree of success. There are many conditions, however, which necessitate the removal of the pulp. I shall mention some conditions indicating devitalization. Probably the most prolific source of pulp irritation is caused by dental caries or the invasion of pathogenic bacteria and the absorption of ptomaine.

Then we have what we might term mechanical irritation, due to such causes as abrasion, thermal changes, close proximity of metal fillings, injudicious regulating, etc.; calcific deposits, or pulp nodules, partially calcified pulps, and secondary dentin.

Many teeth must be devitalized in order to be crowned; for it is usually difficult to grind a vital tooth sufficiently to adjust the band for a crown properly without irritating the pulp and thus endangering its life.

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*One of a symposium of papers read at Kentucky State Dental Society, 1914.

Occasionally, even in filling teeth, it is advisable to remove the pulp in order to properly anchor a large filling or inlay.

Also in treating pyorrhea, the best results can be accomplished by removing the pulp, as it is often in a low state of vitality and its removal seems to stimulate the sluggish peridental membrane.

There are many preparations of devitalizing agents today, the base of each of them being arsenic trioxid. I would hesitate to advise regarding any special one, thinking it better for each operator to select an arsenical preparation with which he can secure the best results and then to use it to the exclusion of all others.

As to the proper length of time necessary to devitalize, it depends upon various things: the condition of the pulp, the age and condition of the patient, the nearness of the exposure, for it is unnecessary to have it fully exposed; and the substance of the tooth, as a tooth of chalky substance.

I will pass over the technic of application briefly by simply mentioning a few rules regarding its application:

1. Do not combine with an escharotic as they form a coagulum over the surface of the pulp and interfere with the action of the arsenic.
2. Never use it in deciduous teeth, where the danger of absorption beyond the apical foramina would be too great.
3. Do not place it over an aching pulp for we should bear in mind that in conditions of venous hyperemia or inflammation, arsenic, instead of exercising its actively destructive property, serves but to exaggerate the existing vascular conditions with the attendant symptom, pain.
4. Exert no pressure on the pulp, for the pain is increased in proportion to the degree of pressure exerted.
5. Never crowd it into root canals.
6. Special care of gum tissue at gingival cavities.
7. Let it remain in twenty-four hours at least.

In spite of all the foregoing precautions, pain is often present after the application of the devitalizant, so much so that it is necessary to resort to the use of some general anodyne or sedative. For this I find some of the coal tar derivatives are useful: ammonal or phenacetin and exalzin, in dose of three grains at the time of application and repeated upon retiring, will act effectively. Morphia sulphate, one-sixth grain, will deaden the pain, but the after effects of morphia are uncomfortable and I would not advise its use.

As to the *extirpation* of the pulp, after removing the dressing, sterilizing the cavity and applying the dam, large sterile rose burs are used to open the pulp chamber freely and to remove all softened dentin. The cavity now should be given such form that pulp broaches may be passed directly and freely to the apex of each root. I believe this rule should be followed no matter how much tooth substance is sacrificed to carry it into effect.

As the future health of the tooth depends almost entirely upon the thoroughness with which each canal is cleansed, sterilized and hermetically sealed at the apex, it is evident that the removal of crown tissue is a small evil compared with incomplete entrance to and cleansing a canal.

If one uses a new, fine (I prefer extra fine), pulp broach, previously dipped in phenol and gently passed to the apex of the root, turning the teeth of the broach away from the pulp until the instrument is fully inserted when the broach is so turned that its teeth shall engage the entire length of the pulp, it may usually be removed entire and with but little discomfort to the patient.

It is a wise precaution in the multi-rooted teeth, after removing the body of the pulp, that the largest canal be entered first and pulp removed. This canal can then be loosely filled with a twist of cotton containing an antiseptic. The next largest canal is cleansed and treated in the same manner, and after this the smallest canal.

If all the operations have been carried out with antiseptic precautions sterilizing the cavity, placing it under the rubber dam, using none but sterile instruments, the canals are now in an aseptic condition and are to be hermetically sealed.

FILLING ROOT CANALS*

BY MAX M. EBLE, D.D.S., LOUISVILLE, KY.

DR. H. J. McKELLOPS, now deceased, but in his day one of the celebrated operators of our profession, once said, at the National Association, that he could fill the roots of molar teeth through an opening in the crown not much larger than a pin head, and that promiscuous cutting away of tooth structure, as is so often done, is nothing short of malpractice.

Dr. M. L. Rhein, who is today one of the leading lights of our profession, says, if in order to get to the apex of all of the roots it becomes necessary to cut away to such an extent as to necessitate crowning, *cut away*, the end justifies the means. While both methods may be good in some instances, in my own practice a happy medium has brought about good results.

As Buckley says, in the filling of root canals, three things are of paramount importance: *First*, to establish and maintain asepsis. *Second*, to preserve the color of the tooth. *Third*, to thoroughly fill the canal.

To obtain the first: When possible, it is best to apply the rubber dam as the safest, easiest and quickest method. If that is not possible or practicable, the use of cotton rolls and saliva ejector is resorted to.

To obtain the second: We take it for granted all decay has been removed from the tooth; especial care is necessary, since nearly all proprietary preparations as well as those which we prepare in our own office, contain some ingredients that will discolor tooth structure. To overcome this, simply dip a pledget of cotton into Sandarac varnish and coat or line the entire cavity. In a few moments hot air can be applied to hasten matters; this hardens, and unless your root canal filling contains a large percentage of alcohol or chloroform (those which I use do not), there is no danger of discoloration, since Sandarac is only readily dissolved by the two mentioned.

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*One of a symposium of papers read at Kentucky State Dental Society, 1914.

To obtain the third: My invariable custom is to funnel the openings of all root canals (Gates-Glidden reamers preferred), to facilitate the introduction of the filling material, which is composed of a liquid and powder mixed to a creamy paste and forced to the apex of all of the roots with gutta-percha cones. This is a very easy matter, since you must remember the roots were handed to me all ready to fill. Frequently, when passing a gutta-percha cone into a root a little pain is produced. When you are quite positive that the apex has not been reached, just wait a moment or two and it can be pressed to the required depth without further pain and little fear of producing pericementitis.

Unfortunately, I presume, for my patients only, there are not a few molar teeth where I fail to get to the apex of all of the roots. In such cases those roots or the root where the apex is reached, is filled as first mentioned, and then a paste is forced as far into the other roots as possible, with unvulcanized rubber and pressure, and in most instances you will get such a response from your patient as will make you feel that your work is well done.

In these days of modernly equipped dental offices, it is easily possible to get your canals as dry as the proverbial bone, or at least the opening into same, which, to a very large extent, interferes with capillary attraction, so valuable in carrying semiliquids into small canals. To overcome this tendency, place a fine jeweler's broach into the canal; then with a pair of long-nosed pliers, place a drop of the liquid into the pulp cavity, when some will follow the broach. Next take an amalgam carrier, dip into your powder, then place the same in the cavity, and instead of mixing on a glass slab, you mix it right in the tooth and pump it in with the broach, with or without cotton, and with better results.

So many never-failing (at least, that is what they claim), root canal fillings are offered today, what follows may be wasted time, but for fear that occasionally it may be necessary to remove one it would be well to select one that you know is composed of such ingredients as are recognized as specified; that hardens after it is introduced, and that can be softened by again applying some of the liquid.

We hear so much of the therapeutic value of copper in cements of all kinds, it would not surprise me if in the near future, on account of that very fact, copper canal points would be placed on the market to be used in place of the gutta-percha. Several years since I bought from an itinerant supply man a box of copper canal points, which were recommended to me not for their therapeutic value but on account of their rigidity—it was easier to force semi-liquids or pastes into the canals and in case of trouble they could be easily grasped with a pair of pliers and removed.

ASCHER'S NEW ENAMEL

BY C. M. BALDWIN, D.D.S., TOLEDO, OHIO

Ascher's New Enamel is the condensed name applied to the latest improvement upon a material that for ten years has been known in this country as Ascher's Artificial Enamel. The name is concise and amply identifies the material.

It was absolutely necessary that this greatly improved product should be clearly and easily distinguishable from the original Ascher's Artificial Enamel, as the two could not properly be worked as one material.

This is the *only reason* why the *New* was exchanged for the "original" and all dealers and dentists were given New Enamel for their old Ascher's Artificial Enamel.

To identify the New Enamel during the nearly two years it has been used in this country, these terms have been placed on the bottles, viz.: "Last Combination," "New" and "Warning—Do not use with old," etc.

The term "*New*" should now be sufficient, as all the Ascher's Artificial Enamel on the market has for some time been replaced with "*New*,"as also stocks in dentists' offices; hence "Warning—Do not use 'old' and 'new' together," should no longer be needed.

Some dentists have asked, "Why have you improved Ascher's Artificial Enamel if the original was such a good material?" etc.

Suppose you ask the same question about the steam or gasoline engine, sewing machine, farm implements, telephone, telegraph, phonograph, moving picture, automobile, aeroplane, or dental equipment generally?

What is our intelligence for, if not to improve and develop as rapidly as possible all useful materials, methods and avenues of achievement?

Has the material really been greatly improved or is it only a claim made by its manufacturers? One dealer jokingly said: "I do not believe the material has been improved at all,"—and the reply was, "You need not believe our statements, but anyone familiar with Ascher's Artificial Enamel *can see the improvements as he works with it*, and I can show them to you." The dealer soon apologized, and said, "I was only joking."

What improvements have been made?

Take some of the Ascher's New Enamel dry powder and rub it between finger and palm of your hand and notice how fine it is. The old Ascher's Artificial Enamel was comparatively quite coarse, especially in the earliest product.

Look at any unopened bottle of acid and you never see any sediment or precipitated material.

The heavy crystal precipitate in the liquid which sometimes occurred interfered with proper chemical action. The Ascher's Artificial Enamel as "Improved" about five years ago practically corrected that tendency—and the powder was made finer.

Materials seriously deteriorated by exposure to air has caused many failures in silicate work generally. Should the "*New*" powder and liquid bottles be left open for hours, you would notice no difference in working the material. It is a great triumph for Ascher's New Enamel to be so freed of this danger. This remarkable freedom from injury by air exposure should not cause the user foolishly to leave bottles open.

Mix the *New* and see the improvements during slab work. You will notice the powder used is proportionately from 25% to 30% more to a given quantity of liquid, and may even be increased above that at times, but we are considering average work only. It is further very noticeable how easily the final additions of powder disappear in the mix and show no traces of minute particles unsatisfied with acid. This increases density and strength.

The time of mixing is longer, giving a decided advantage in watching the consistency and shades as they develop when two or more are blended together.

There is much greater certainty in mixing for 2½ to 3 minutes when correct for a material rather than for so short a time as 1 to 1½ minutes. A variation by the individual of 15 to 30 seconds might influence the shorter-time mix disastrously. The longer time also assists one in adding the proper proportions of powder and liquid.

A chemist might devise an ideal chemical material for fillings, but in proportion as its working qualities required conditions for its *chemical success* that were either impossible or very difficult to follow for practical use, would the ideal chemical material prove valueless for fillings.

To properly apply silicate materials to the cavity has always proven one of the chief difficulties, due both to the stickiness required and the crystallization developing before the filling had been skillfully inserted.

Varying with the mix, the *New* allows 3 to 4 minutes of operating time. Dentists should carefully consider what that would mean to them. Time the operation with any material you are using, and notice how much crystallization has developed as you finish packing.

After the material has been placed in the cavity it will set more quickly than the old Ascher's Artificial Enamel.

Is that considering the operator's side of the work? Very decidedly, with a great big D. More good working time and quicker setting later.

Packing qualities, too, are better than before; this is noticeable. It was considered remarkably careful methods when the shades of the powders originally were made by fusing the pigments in porcelain, which was then made into a fine powder and mechanically mixed with the white *completed* Ascher's Artificial Enamel powder. To be further assured that the various shades were securely combined with the powder, an additional safety measure was developed and used with the *New* Enamel—viz.: as before, the pigments are fused in porcelain to secure the required shade, *but before the powder has been completed*, the shades, as powdered porcelain, are *fused* with it, and again reduced to a very fine powder. This extreme precaution should satisfy anyone, and is typical of the entire process of manufacturing Ascher's New Enamel.

Two shades have been changed slightly and three new ones have been added, making a total of fifteen, two or three of which may be blended together to match any shade of the natural teeth.

The original Ascher's Artificial Enamel was the earliest translucent cement and with favorable conditions was an invisible filling, but this success was not as easily achieved by many as could be desired, and when the *New* appeared with *much greater translucency*, it became easy for all to insert invisible fillings. The very fine grain of the powder, and its complete disappearance in the moist mix and filling, marked a great advance in tooth-like surface and appearance.

The remarkable success of Ascher's Artificial Enamel has surprised the dental profession.

When amalgams were studied and we were instructed that alloys having different proportions of silver affected our fillings accordingly, manufacturers very soon discovered that they must make high-proportion silver amalgams or they could not satisfy the demands of the awakened dentist.

In silicate work this same reasoning should be applied, viz.: that the different silicate products differ as to ingredients and process of manufacture, and necessarily possess various and different properties or qualities; consequently fillings will show the effects of the difference, insofar as the silicate products vary one from the other.

In large measure, writings upon the silicate question have ignored this feature of the problem, and conclusions have been formed too much about the silicates as a class, judging all of them by the behavior of a single member of the class.

Another most unusual element that has influenced our judgment is that operators who failed most or considerably were the ones who wrote most of the articles for the journals, while those who have been most successful have not put themselves on record. Of course there are exceptions to these conditions.

Many operators are known to have used Ascher's Artificial Enamel and later Ascher's New Enamel continuously for from five to ten years, without writing anything about their success or the methods by which they have achieved such results.

All such results must have been due to some adequate cause. What was it?

Ascher's Artificial Enamel has been manufactured continuously by one company, which secured patents in all civilized countries so that other companies could not duplicate its material. Many other silicate cements have come and gone during the same period.

Ask yourself why. All ingredients contained in Ascher's Artificial Enamel, with but one exception, they could use freely. The patents claim that *beryllium* is acted upon chemically by the orthophosphoric acid, producing a *beryllium compound*, and government chemists generally have allowed the claim.

H. Carlton Smith, Ph. G., Instructor in Chemistry, Harvard Dental School, in 1906, stated that phosphoric acid acts on the beryllium and "produces a decidedly sticky mixture and this oxid undoubtedly plays an important part in making Ascher's Artificial Enamel sufficiently adhesive for dental use;" also: "I believe that Ascher's Artificial Enamel will be found valuable insofar as it contains beryllium," which is about one-fourth of the bulk of powder.

The old familiar question that should first be considered when examining the record of a silicate cement is "how long does it resist saliva in the average mouth?" This is of the greatest importance and requires years, preferably five or more, to arrive at any fair estimate of its value from this consideration. All other features must be secondary, or down to 32dly, compared to the saliva test, for unless it can successfully meet it, there is no further need of comparisons, as soon it will not rank with successful silicate cements. Before Ascher's Artificial Enamel appeared on the market, no cement had met the saliva test successfully, and no other cement can use beryllium chemically or be in the same class chemically. Will any other chemical mass resist the average saliva as well as has been proven with Ascher's Artificial Enamel? Time alone will tell, but it takes time.

Soon after the first company manufactured body for porcelain inlay work, many companies offered their productions of similar materials, but these varied more or less in quality, and especially were divided into high- and low-fusing bodies. Dentists when writing of their experiences, which the *successful users did freely*, found it necessary, if they were to be understood, to state whose article they used, whether high- or low-fusing, and the temperature at which it fused.

Free and intelligent exchange of professional experiences is absolutely necessary if a profession is to benefit by the combined success of its members, and silicate work is the only exception to the rule in following such a course generally. Each member of a profession is entitled to the information contained in its combined membership if he chooses to seek it.

When Ascher's Artificial Enamel was introduced there were *no expert users to teach good methods*, what to avoid, or inform us about the material, which was a direct contrast to the beginnings of inlay work, etc. The result was that when various types of failure occurred, early impressions and statements by users were that the *material* fails thus and so, which relieved them of the responsibility, hence no effort on their part to correct their technic. To make a long story short, the years have demonstrated clearly that either the material had deteriorated, a dangerous method had been used, or the user had not a proper set of instruments nor learned to use them and the Ascher's Artificial Enamel skillfully, as all kinds of failures have been overcome by the corrections as mentioned, and without changing the Ascher's Artificial Enamel, *but* never should it have been used when deteriorated.

It is almost a crime that this knowledge which has been gathered by the distributors through years of daily contact with the dentists, should not have been largely and freely spread among the profession through the *regular channels.* Even the successful users have not had the full confidence that they should and would have had with corroborating opinions and experiences of other successful users. "In union there is strength;" "divided we fall."

The Ascher laboratories have protected *Ascher's New Enamel* to a surprising degree from loss in quality because of necessary air exposure, or carelessness, and have altered the working qualities decidedly favorable to the operator, as well as markedly improving the beauty of the finished fillings.

An unusual freedom from all kinds of objections has been the experience with Ascher's New Enamel. The wise selection of materials bears a most important share of your degree of success, but in no field of dental operations has the dentist been quite so uncertain as in silicate work.

It is unnecessary to discontinue use of one silicate in order to try another one. Buy one or two average shades in small bottles, and use in teeth where shades are favorable. Keep a detailed record of the kind used and other points of comparison.

Very briefly stated, the improvements of the Ascher's New Enamel are:

1st—Almost complete freedom from deterioration by air, either standing in closed or open bottles, or on the slab.

2d—Powder is very finely pulverized.

3d—The mix requires from ¼ to ⅓ higher proportion of powder, which greatly increases density and strength.

4th—A longer mixing time—from 2½ to 3 minutes.

5th—A longer working time to place filling, giving from 3 to 4 minutes of good plasticity.

6th—Crystallizes quicker in cavity.

7th—Pigments used for shades are twice fused as in porcelain.

8th—Translucency and general appearance greatly improved.

The August, 1914, issue of THE DFNTAL SUMMARY announced that its pages would be open to those desiring to contribute articles for the better understanding of this subject. In the same number, on page 666, will be found a short paper by the writer, entitled, "Confidence in Silicate Work."

Unless a man has faith in himself there isn't much hope for him.

COMBINATION GOLD AND PORCELAIN INLAY

With the first introduction of the gold inlay attempts were made to produce an inlay which would have its conspicuous surface covered with porcelain. Many methods were tried, but none has seemed so satisfactory as a method recently shown and now much utilized in the United States. This method even permits the use of a gold inlay in the anterior teeth. The procedure is to make a gold inlay of such form that all that part where strength is required shall be of gold. Such part as would be easily seen is cut away from the wax pattern and a box formed, one edge of which shall be the margin of the tooth, the box, of course, only appearing as a box when the inlay is set. After setting the inlay this box is filled with a silicate cement to match the tooth. Such combination inlays having been made, it was discovered that the beautiful transparency of the cement was lost by having the gold back of the filling, but in the more recent inlays of this character this fault has been largely overcome by cutting windows completely through the gold. These windows afford a better hold for the cement, and by permitting the passage of light restore the translucency.—DR. R. OTTOLENGUI, in *Items of Interest*.

ANALGESIA*

BY DR. WESLEY M. BACKUS, BUFFALO, N. Y.

INTRODUCTION

IN PRESENTING A TALK on analgesia, the method with patients must invariably be on the optimistic side. That they are going to have a pleasant experience, thinking all the way, yet conscious that their tooth is being prepared without suffering to them, assured that there will be no after-effects hindering them in the completion of their day's work—and such other assurance as the individual operator may confidently express in his own way—all creating confidence in the operation, goes without proof.

But before dentists here assembled, my method can better take the opposite side. I am quick to comprehend that right here are some who are well seasoned in analgesia, some who have no apparatus, have never even administered it, or perhaps even breathed it themselves. Then there are those with some experience, perhaps having owned a machine just long enough to have had one or more failures mingled with some success.

THE FAILURES

As the successes will take care of themselves, then let us consider the failures. With a good supply of gas and oxygen and a machine transmitting it perfectly to the patient, we have eliminated any mechanical causes of failures. Machines complex in construction and simple in operation, or simple in construction and complex in operation, will each do the work if manipulated as intended. To manipulate well, a chart of our journey is to be etched in our memory.

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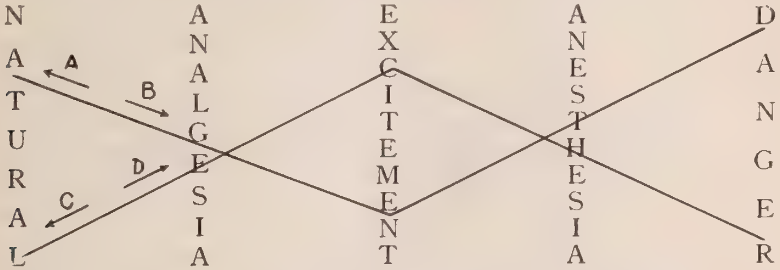
*Clinic Northern Ohio Dental Society, 1914.



The Chart

Starting with the natural, the patient will go first into the analgesic stage, and then may go through an excitement stage, of more or less duration and even into profound anesthesia, and thence to danger. It is for this reason that the operator must prepare himself with a rudimentary knowledge of anesthesia while operating usually under mere analgesia. Especially must he be trained to detect danger signs and of these, blueness and sweating together may be taken as such and his knowledge of the value of his oxygen pure, taken into account, not forgetting a more profound knowledge of restoratives as well, all of which are not quite my subject, but are merely touched upon here.

EXCITEMENT

By far the most prevalent objection to using analgesia as uttered by the novice, is the fear of the excitement stage. He fears the patient will attack the operator, if powerful enough to do so, and wreck the cuspidor, windows and everything in sight. Some fear the patient will die right there. Hence, he does not purchase an apparatus, he knocks the greatest boon to suffering humanity recently brought within our reach, and constantly remains retrogressive in his practice.

Obviously, the patient will not die in the excitement stage, but he may indeed do some damage if the operator does either of two wrong things at that instant. We shall consider these separately.

SAFETY HOLD

First, use a safety hold.—Any hold is a safe one that will hold the patient. But the following suggested by Dr. Hadley is very good. Left arm under head rest, grasp symphysis. Right hand under patient's right, and grasp left wrist, drawing toward you. Incline head and shoulders back to avert patient's right hand, which can come up, but not violently, and its sweep is limited. The chair should be locked before seating the patient, to prevent its rotating.

Second, don't make the mistake of giving more oxygen here. That will increase the excitement. By consulting diagram you will see that you have passed the analgesia stage and have gone too far. Retrace by giving more gas and less oxygen (not all gas and no oxygen). Should you give all gas and no oxygen you will reduce the excitement but pass into anesthesia.

OPERATING IN THE STAGE OF ANESTHESIA

If the patient does momentarily drowse, operate. Why not? No reason, as long as there are no danger signs. Possibly forty per cent. of your cases may be under anesthesia, but the longer you operate the larger per cent. under mere analgesia.

PER CENTS.

Many men are concerned over exact per cents. Dentistry, like all medicine, is not an exact science. Some are bound to require more than others, and right here there is a natural method of ascertaining it. Lower the patient from half-and-half into excess of N_2O over O. In other words, the half-and-half line is a good place to start. It is the most natural, unless one starts on pure oxygen, which is wasteful. Many cases of analgesia are perfect, one or two points toward N_2O from the half-and-half line. Some are several points over and some about one-half of one point only, especially blondes.

A. B. C. D. ON CHART

The marks on chart between the *natural* and the *analgesic* stage are not danger marks, but may prove obstacles to success. They represent bad blood and other difficulties in induction, *e.g.*, snuff eaters, cigarette fiends and other dope fiends may have their blood so charged with these things that N_2O with O may not phase them to the degree of analgesia. To operate at all you may have to reduce the oxygen rapidly and take them at once into anesthesia. Here your chances of danger signs are doubled. Your time of operating should accordingly be halved.

AVOID

Avoid known cases of angina pectoris (blueness and sweating will come, first few whiffs). Also avoid goitre and adenoid cases and crying children. With the latter there are very deep inhalations and they may go very quickly into anesthesia, present pallor, alarm the mother and spoil the success that was there, had there been calm instead of tears. In short, refuse all cases of analgesia not up to your standard of probability as you would refuse any operation about the dental office not in accord with your theory and practice. Stubborn children will be your most signal successes.

FINALLY

Finally the analgesic stage, unlike anesthesia, gives you both subjective and objective symptoms, for the patient will describe the subjective and you can view the objective, two of which are thick speech and perspiration. Gentlemen, there are other points, but I thank you for your attention these twenty-five minutes, our limit, and would urge you to use all the forces at your command. Cut from, use sharp burs, use analgesia; all three and you have a satisfied patient and increased fees, with little dental fatigue or operator's exhaustion. If you value their potential and yours and a clear conscience in well doing—do it. Personality and confidence are great factors—but these are individual achievements in their own field.

DENTAL SCIENCE AND LITERATURE*

BY RUSSELL W. BUNTING, D.D.Sc., ANN ARBOR, MICH.

THOSE WHO FOLLOW the dental literature as expressed in the articles which appear in our professional journals, cannot fail to see that there has been from year to year a marked improvement in the character of the contributions. Gradually the large number of technical articles which formerly were greatly in predominance, have been displaced by more scientific discussions, which have considered the ultimate factors in the various problems of dentistry and have looked toward the attainment of a standard which would approach the ideal. It is interesting, therefore, to note the steps by which our profession has advanced as marked by the character of its literature, and it is gratifying to see that by these means we are fast approaching the time when dentistry may truly be called an exact science.

And in this regard the literature of the past year, which we are about to review, has been no exception. There has been a wealth of articles in the various departments of dentistry, which have shown an effort on the part of the writers to apply the best information in chemical, medical and other allied sciences to the subject under consideration. Many of these contributions have crossed over that imaginary line between medicine and dentistry and have been of equal value to the literature of both professions. So that already we are responding to that challenge which was given us by that member of the medical profession who said, "The next great step in preventive medicine must be made by the dentists. The question is, Will they do it?"

In his endeavor to summarize the literature of the year in the limited time at his disposal, the writer of this report has thought it best to discuss but a few papers which are of special value, rather than to summarize in a general way a much larger number which might be entitled to consideration. Of these, the first to be considered is an article entitled, "The Diagnosis of Diseases of the Dental Pulp," by Dr. Herman Prinz. This article, which appeared in the September issue of THE DENTAL SUMMARY for 1913, covers the list of various means of pulp diagnosis, and describes in detail one method which is, in the opinion of the author, the most effective. Dr. Prinz calls attention to the fact that the symptomology of the pulp is but poorly understood and that our means of diagnosis are inexact and ineffective. He mentions the various physical, chemical and thermal tests which are made use of for diagnosis, as well as the value of the skiagraph for this purpose. He then speaks of the recent use of the electric current for the estimation of the life and degree of vitality of the dental pulp.

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*Read before the Michigan State Dental Society, 1914.

The essayist describes in detail the method of applying the electric current. For this purpose he makes use of a small portable outfit which he has found to be most adaptable to general office purposes. He speaks of it as being "a small transportable induction coil which is fed by a dip battery or dry cell battery, and which gives universal satisfaction for the purpose in view, because of its cheapness, simplicity and ease of transportation."

The technic of its operation is carefully described as follows: The positive electrode is held in the hand by the patient. The negative electrode ends in a terminal carrying a bit of moist cotton which is pressed by the operator upon the tooth to be tested. Several vital and healthy teeth are first tested to determine the response given by them to the electrical stimuli, the current being started at zero and advanced until a point of distinct sensation, less than of pain, is noted. The tooth under consideration is then tested, and the response is compared to that of normal teeth. The author gives the following scheme which may serve as a guide for making diagnosis by means of the faradic current:

1. The normal pulp responds to the faradic current at its irritation point.
2. The irritated pulp responds very readily to the faradic current at the irritation point or very slightly below it.
3. The inflamed pulp responds to the faradic current below the irritation point. The more severe the irritation the more ready the response to the current.
4. The inflamed pulp with pus infiltration responds to the faradic current above the normal irritation point. The more severe the purulent condition, the less ready the response to the current.
5. The dead pulp does not respond at all, not even to the full strength of the faradic current.

The author then enters into a discussion of the various phases of pulpitis and gives the faradic symptomology of each. The paper very thoroughly covers the technic of this method of diagnosis and is a valuable contribution to our literature upon pulp symptomology.

In the *Dental Cosmos* for November, 1913, there appears an article entitled, "Conflicting Opinions Concerning the Manufacture and Use of Alloys for Dental Amalgams," by Dr. Marcus L. Ward, that seems to be about all that has been written on the subject of metallurgy since our last meeting. In the first part of the article, the author gives a brief review of the articles which he has written since 1905, showing that it has been his aim to inform the profession on the subject of alloys used for amalgams to such an extent that they could distinguish between the good and poor ones without the necessity of mentioning trade names. He next reviews briefly the work of Drs. MacCauley and Bliss, which appeared some time previous to the appearance of this article and which seems in his opinion to have had a tendency to create a distrust in the ability of some of our best known manufacturers. In the article he criticises Drs. MacCauley and Bliss for, first, presenting tests that tended to condemn the products of well known manufacturers without having these tests verified by other workers on the same subject, and second, for condemning the use of zinc in alloys for amalgams without either clinical or experimental evidence.

He then scrutinizes the articles which have been written by W. W. Atkinson, a laboratory man, which describe a hypothetical alloy of the formula Ag_2 Sn Cu, which was claimed to be much superior to other alloys made without regard to their chemical formulæ. Under the guise of having an alloy of chemical balance, Mr. Atkinson seems to have created about as much distrust in well known manufacturers as had Drs. MacCauley and Bliss with their tests and unsupported statements. Owing to the fact that chemical balance often means so much, Dr. Ward goes into detail to point out to Mr. Atkinson and those of the profession who had been following him, that alloys in their true sense are not chemical compounds at all. He mentions that when most metals are mixed there is not the total and complete alteration of properties which is the distinctive feature of chemical action between a metal and non-metal. He quotes A. Humbolt Sexton as saying that "None of the definite chemical compounds are of any use in the arts," and that "definite chemical compounds in no case form alloys of any industrial importance," and follows this with a quotation from Hiorns that "Most often alloys seem to be mixtures of definite compounds with an excess of one or other metal."

He then takes up similar statements by Fulton, E. F. Law and others to show that Mr. Atkinson has no ground for claiming superiority for his alloy of the supposed formula Ag_2 Sn Cu, even though it should be proven later that this compound exists and that he can produce it. The tendency of the article is that of restoring confidence in our well known manufacturers and with this mass of evidence in favor of them, which Dr. Ward has given, we may be assured that the manufacturers of our dental alloys are keeping pace with the profession, if not in advance of it.

In the October issue of the *Dental Cosmos*, Dr. Pickerill gives a paper which is supplemental to the histology of the enamel previously given in his book on dental caries. In this he takes issue with certain views of this subject which have been stated by Tomes, Black, Noyes and others, and which have had general acceptance. In the first place he objects to the explanation of Lines of Retzius as being due to pigment in the enamel, but says that they are merely optical effects produced by the overlapping of prisms.

He further objects to our present conception of the enamel rods as being straight prisms which run a nearly parallel course from the dentin to the periphery of the enamel. He says that the course of the enamel rods is a spiral one, not running in straight lines at any place. He describes them as being grouped in spiral bundles, the course of contiguous bundles being of opposite twist, and that the bundles end at the periphery at an acute angle with the surface of the enamel. Those short, supplemental rods which have been described by Noyes as being "wedged in" at the periphery of the enamel, according to Pickerill do not exist. The filling in of the space in this region he explains as being accomplished by an increase in size of the enamel rods at their outer ends.

The author gives a new definition of enamel spindles in which he speaks of them as being "transverse sections of continuous interprismatic 'spaces,' and are expressive of deficient function." He strongly objects to the views of Von Beust and others that there may be a passage of nutrient canals from the dentin to the enamel, and states that the union of the enamel with the dentin is largely mechanical. This paper is interesting because of the fact that it is a scholarly contribution which takes radical issue with many of our present ideas of the subject.

Two very valuable contributions have been given to the study of orthodontia by Dr. G. V. I. Brown during the past year. The first of these appeared in THE DENTAL SUMMARY for 1913, page 901, and the second in the *Dental Cosmos* for 1914, page 137. In these papers Dr. Brown gives the results of experiments which he had made upon a series of puppies in the laboratories of the Parke, Davis Company, and cites analogous cases of patients to whom he has given orthodontic treatment. As a preface to his work he cites the results of a similar research by the late Dr. Anderson, of Detroit. This work was done by producing an artificial stenosis of the nasal passages in dogs and guinea-pigs from which Dr. Anderson drew the following conclusions:

1. Nasal obstruction leads to death, or serious impairment of vitality.
2. That the lowered resistance predisposes to infections.
3. That local disease of the respiratory tract is induced.
4. That obstruction of the nostrils leads to dilatation of the heart.
5. That changes in the skin and blood of the dogs occur.
6. That symptoms resembling asthma and emphysema may be induced in the lower animals.
7. That emphysema of the lungs can be demonstrated histologically.
8. That reöpening of the occluded nostrils is followed by prompt disappearance of the symptoms.

All of the above observations Dr. Brown has verified in similar experiments upon dogs. He also restates his former assertions that the intermaxillary and palatal bones may be separated by lateral pressure upon the teeth in the expansion of the jaw, and that such an expansion will result in the expansion of the size of the nares as shown by actual measurements by rhinologists. He cites many cases of children having high arches and narrow nasal passages who exhibit in a lesser degree the condition of malnutrition, and lowered vitality and resistance which was seen in the dogs under experimentation, and that these symptoms were largely relieved by proper orthodontic treatment.

In regard to the effect of maxillary enlargement he says, "The concentration of all this canine and human evidence has crystalized itself in our minds into the belief that there is a more direct transmission of influence between the growth centres of the brain and the naso-maxillary region than has been commonly appreciated. * * * Separation of the maxilla might thus convey in the course of time a measure of influence resulting in a greater freedom in osseous development, which might be influential in affecting the pituitary body and the developmental functions of the hypophysis."

The results of his work warrant the author in drawing the following conclusions:

1. The centers governing trophic changes may be directly benefited by maxillary separation, which relieves nerve tension and compression in the region of the jaws and teeth, widens the nares and thus makes possible better respiration.

2. In young persons it is only reasonable to expect the effect of expansion in the lower regions of the face to favor also greater freedom of growth in the higher structures at the base of the skull.

3. It is not impossible for this influence to extend still higher until it could affect the form of the sella turcica and thus reach the hypophysis which is now recognized as an influential factor in abnormal growth.

As a further substantiation of the effect of maxillary development upon the brain case, Dr. Weston A. Price reports an interesting case in the April number of THE DENTAL SUMMARY for 1914. The case in question was a boy of about nine years of age, who was simple minded and had the action and intelligence of a child two years of age. In the treatment of the case, Dr. Price forcibly widened the arch which was very high and constricted, until there was produced in a few months' time a space of three-quarters of an inch between the upper central incisors. At the same time, and seemingly as a direct result of the treatment, there occurred a complete change in the mentality and development of the boy. The results obtained, which were so highly gratifying and peculiarly startling, Dr. Price attributes to the release of undue pressure which had been put upon the sella turcica and pituitary body by improper facial development.

Several papers have appeared upon the subject of pyorrhea which are worthy of mention. One of these was written by Dr. E. C. Kirk, and was published in the *Dental Cosmos* for 1913, page 577, under the caption, "The Locus Minoris Resistentiæ in Pyorrhea Alveolaris." In this paper Dr. Kirk makes a very careful resume of the literature, placing special emphasis upon the work of Black on the pericemental glands. Inasmuch as these cell nests are degenerative remains of embryonal tissue they are therefore of low resistance, and their presence is regarded by the essayist as a favorable point of infection by systemic means, a place of least resistance. In his conclusion he says, "In presenting for your consideration the foregoing aspect of the pyorrhea problem you will recognize that I regard the disorder as a local lesion symptomatic of a constitutional aberration from normality, a nutritional vice having a local expression." From which we may see that the author considers pyorrhea to be of systemic origin, and that the point at which the irritating substance most easily becomes lodged is in the glands of the peridental membrane described by Black.

On page 1094 of the 1913 *Cosmos* there appears an article by Dr. Thos. B. Hartzell which considers the operative treatment of pyorrhea. In his description the author urges that the treatment of such cases should first begin with the thorough polishing of all enamel surfaces, with the use of fine polishing powders and a disclosing stain, before the roots of the teeth have been disturbed.

He next describes the treatment of the roots. He speaks of the cementum as being composed of three layers, an outer rough layer to which is attached the pericementum, an inner cellular and porous layer, and a middle one which is hard and firm, capable of taking a smooth surface. In his instrumentation he aims to remove the outer rough layer and to produce a smooth surface on the middle portion, being careful not to cut through into the inner porous layer. He describes the types of instruments to be used and the technic of their manipulation.

In his attempt to regenerate new bone in pyorrhetic pockets the author aims to leave and protect a firm blood clot in the pocket after the root has been planed. To this end he paints the orifice of the pocket with a solution of creosote and iodine, which, having been dried, is covered over with a solution of tannin in glycerine. This treatment will protect the clot for 24 to 48 hours. The pocket when so treated is left unmolested, and no massage is used until all hope of further bone regeneration is gone. As a gum massage a solution consisting of equal parts alcohol, gylcerine and decoction of red oak-bark is recommended.

The author warns against the danger which may be encountered in case a large number of pyorrhetic pockets be opened and curetted at one sitting. He says that in this manner the granulations which exist in such pockets are broken up and a too large dose of infection may be set free in the circulation, giving rise to symptoms of septicemia and systemic poisoning.

In conclusion he speaks of the necessity of splints for loose teeth. He recommends a diet of vegetables and citrous fruits, but one vegetable to be taken at a meal. In regard to vaccine therapy he states as follows: "Vaccines are needed only when recurrence occurs in a clean mouth or when the patient's resistance is very low, and then only when such tonics as peptomangan fortified by strichnia and iron or phosphorus have failed, or when a joint infection will not yield after the initial focus in the mouth has been eliminated, at which juncture an autogenous vaccine is indicated."

At a meeting of the American Medical·Association, Dr. Hartzell gave a paper entitled "The Responsibility of the Dentist and Physician in Regard to Mouth Infections," which was published in THE DENTAL SUMMARY for 1913, page 937. In this article Dr. Hartzell calls attention to the large amount of infection which may exist about the necks of the teeth and in abscesses of the deeper portions, and shows the avenues by which these infectious materials might easily be picked up by the circulation to produce systemic results.

The writer gives a report of 1,020 cases of mouth infection and correlates them with their general bodily condition. Of these there were 600 who had no general symptoms and were healthy except as to their mouths. Of the remainder, 300 gave evidence of physical disturbance, though not severe enough to warrant sending them to a physician. In the remaining 120 cases a great variety of physical ailments was observed, and physical examinations were made. In 80 of these cases the patients suffered from chronic constipation or diarrhea, and a greater or less general malnutrition. Fifty had severe migrane and all were nervously irritated. Twenty had severe apical abscess, 60 had rheumatic pains, and 40 had kidney changes and abnormal urine. Of those cases which did not have kidney involvement, the author says, "Without exception all were benefited by treatment, showing a marked recession of constitutional symptoms on removal of abscessed and hopelessly loose teeth, and on surgical treatment of those teeth remaining which were worth treatment, followed by careful post-operative care of the mouth." Of the other 40 cases he says that some were benefited and others were not. In his conclusion the writer makes a plea for more close scrutiny on the part of physicians and dentists of the infections which exist about the teeth and at the apices of the roots, with reference to their effect upon the general nutrition. He recommends to the physicians that they advise all patients suffering from such infections to have all diseased teeth extracted unless they have access to the services of a dentist who is qualified and able to put the affected teeth and alveoli in a healthy condition.

Upon the discussion of the causes of dental caries, two papers of worth have appeared, and which should be considered. The first of these is the report made to the New York State Society at its last meeting by Drs. Lothrop and Gies, which was published in the *Journal of Allied Dental Societies*, December, 1913. The report begins with a review of the previous work done by the authors upon the subject, while the substance of the report is concerned for the most part with experiments upon the value of organic acids as mouth washes. The various fruit acids were tested as to the strength of their acids. Of these it was found that lemon is the strongest, being twice the acidity of vinegar, while orange, grapefruit and apple are much weaker than either.

The paper then treats of the effect of vinegar solutions upon tooth substance, and states a series of experiments by which the authors attempt to show that the effect of the vinegar upon the tooth is but slight. Cases are cited in which vinegar has been used as a dentifrice for several months, in which, in the opinion of the patient and the dentist, the teeth have been kept cleaner and the oral hygiene improved. The authors urge that the acid dentifrices be given a thorough trial by dentists over the land with the view of gathering data and comparing results.

In an article entitled "A Reconsideration of the Etiology of Dental Caries and a New Theory of Caries Susceptibility," which appeared in the *Dental Cosmos* for 1914, page 1, Dr. Kirk has given his latest contribution to the subject. In this paper he has made a most careful resume of the present knowledge of the question and the steps by which we have arrived at these conclusions. He then reviews his former statements as to the importance of the carbohydrate content of the saliva, and takes up the discussion of the control of the carbohydrates secreted in the saliva. He shows how certain changes in the internal secretions, such as that of the hypophesis cerebri, pituitary gland and thyroids, will cause an increase in the sugars of the blood. In such cases, it is his opinion that the sugar content of the saliva is increased, the carbohydrate not existing as free sugar but in combination with the proteins, i.e., gluco-proteins. Dr. Kirk then calls attention to the fact that during the teething period from infancy to early maturity, during pregnancy, and during many states of illness and malnutrition, there is a pronounced effect upon the organs of internal secretion which would tend to increase the general sugar metabolism. That these states are frequently and usually coincident with the condition of susceptibility to caries is considered by him as a significant fact and is offered in substantiation of his assertion that caries is dependent for its existence and rate of growth upon the carbohydrate content of the saliva.

This contribution to the subject of dental caries is very suggestive, and should it be found by laboratory and clinical evidence that the theory as stated is correct it will open up a vast field of investigation as to dietetics and their effect upon the disease. Dr. Kirk says in his conclusion, "The question of food habit in its bearing upon susceptibility to caries will be found to involve more than an empirically balanced ratio of carbohydrates to proteids in the dietary on a calorimetric standard: it will involve also the factor of carbohydrate tolerance in determining the nutritive balance of these food principles as related to their varying individual needs."

DISCUSSION

Dr. C. H. Oakman: Dr. Hartzell said it was unwise to open too large an area in the mouth for the reason that bacterial infection may occur and serious results follow. I can illustrate that by one or two instances which have occurred in my own practice. Sometime ago a young girl, with a very unclean mouth and suffering from pyorrhea and abscesses, came to me for treatment.

Her gums and teeth were very sensitive, to such extent that it was necessary to administer gas and oxygen before anything could be done in order to carry out the treatment. Having her under an anesthetic, a little more heroic work was done than if she were conscious.

She subsequently developed pneumonia, but the point has occurred to me not to be too radical in the treatment of these cases, as pneumonia was probably the result of inhalation of septic material from the mouth. It is, of course, unusual to place a person under an anesthetic in the treatment of pyorrhea.

Another case was that of a young lady who was never well since she was eighteen years of age, and is now twenty-seven. In asking her how she felt, she would answer, "Just fair." She would never say she was well.

She had been to a number of physicians and dentists, but nothing had ever been done for her that gave her relief. This case came to me through her uncle, who is a physician.

She was treated in Europe as well as in America, and had undergone various operations, among them mastoidectomy, adenectomy, tonsilectomy and operations on the nasal septum.

Her uncle, having heard me make a few remarks at a medical meeting one night, said, "I want to bring my niece to you. I cannot understand her case and wonder if there is anything in your line of work that would help her." The condition was supposed to be congenital Lues, although the father denied ever having any lesions. A Wassermann reaction was made from the patient's blood and the result was doubtful.

This surmise may be true, but as far as the father knows he never had a primary lesion. However, he has developed locomotor ataxia, and it may be fair to presume that there was some blood taint present.

When this lady came to my office, her gums were highly inflamed and on touch were painful. A bacterial examination showed the presence of a virulent streptococcus from which an autogenous vaccine was made. She did not experience much change until after the fourth injection. The injections were continued for six weeks, at which time a marked improvement was noticed, when she stated, "I feel better than I have in a number of years." About the time the patient was to be discharged, as I was exploring in the region of the lower left third molar, I found a pocket of pus deeply seated, which I curetted.

On the patient's return home she developed a chill, followed by a rash on her face and chest, which disappeared in a few days. The patient was kept in bed and the wound treated antiseptically, followed by suppurative treatment, after which the case gradually cleared up.

This was undoubtedly a systemic infection, due to dissemination from a local pus pocket.

I might state that a vigorous anti-luetic treatment was combined with the aforementioned measures.

Dr. C. B. Wood: I am spending most of my time treating pyorrhea cases referred to me by other dentists, and I think I can conservatively say that seventy-five per cent. of those mouths, after I have looked after the bad root canal conditions, and perhaps extracted the hopeless cases, that is, cases that have gone on so long that the abscessed condition cannot be overcome, after I have taken care of those bad teeth and bad cases of supposed pyorrhea primarily, which have been brought about by bad root canal conditions,they are not serious at all, proving to me that the most of our very bad pyorrhea cases are primarily not pyorrhea; they are simply faulty root canal fillings, or neglect by the dentist or the patient in looking after those abscessed teeth. Blind abscesses not only eventually cause loss of tooth, but may cause ear, eye and all sorts of systemic disorders. I think many of us have seen in our own practice and that of others cases of blind abscess that have gone on for years, and because they do not keep the patient up nights, or were not acutely painful, were let go in that condition until beyond repair. I have come to a point, when these cases come to me, if there is isn't a chance of opening that root canal and removing that abscessed condition within a very short time, I would take out that root or that tooth altogether, as the case might be. Yesterday a physician was referred to me with an abscess on the mesial-buccal root of the first molar. I decided within two sittings that it was impossible to relieve that jaw through the root canal. I said, "Between working on this case for a month and then failing to cure this, and between taking that root out and having a good solid tooth there, which will you have?" He said, "Take the root out," and within ten minutes the root was cut off and out of his mouth, and he was happy, because he had had a sore spot over that root for some considerable time, and had worried about it. I think that part of Dr. Hartzell's recommendations where he says if the patient cannot be relieved of that condition by a very proficient dentist, one who is sure he can get a healthy condition of that jaw, the tooth had better be out at once, is a very excellent one. As to the point Dr. Bunting brought out as to the use of acids in the place of alkalies in the general treatment of the mouth, mouth washes and dentifrices, I had a talk with Dr. Bunting some time ago with reference to that and he urged that I in my practice use vinegar for a mouth wash as an experiment for a while to see if we could not come to some conclusions. I had two patients whom I knew had confidence in me and I put them on the vinegar diet; and I think they knew Dr. Bunting's reputation. I told those patients about the subject and they immediately went away to use the vinegar and I haven't seen them since. I now conclude that they had such confidence in Dr. Bunting's recommendations that they thought they were cured anyway and they needn't come back.

Dr. Bunting: Maybe they can't come back.

Dr. Oakman: I think Dr. Wood made some very good points but there is one that some may get into difficulty on. That is as to amputating the buccal root of molars. The roots of many teeth at the floor will penetrate the antrum or nearly so and when you cut across there and amputate your root you are very close to entering the antrum. A great many roots have been amputated where the antrum has been entered and that very often sets up infection. Rather than have antrum infection I would take my chances with appendicitis. I think the more we see of these antrum condition the more we know of the havoc they do to our patients. I would urge caution in that respect. We sometimes go into the jaw, go into the bone, and figure, "I will take off that root somewhere." You don't know whether you have entered the antrum or not. If you have you have infected it and it may take years to get over it.

Dr. Wood: I don't know whether I used the right term or not but I sometimes amputate the ends of the roots of teeth. What I referred to particularly is taking that root off bodily, absolutely taking that root off of that tooth, making a two-legged tooth out of a three-legged one or taking off two roots and leaving one. That is the point I meant to bring up. That tooth will stand with only the buccal root.

Dr. Oakman: I think when you cut low down it is safer than when you cut high up.

Dr. Wood: Yes; all I had to do was to run a bur around there and it was a very short operation.

Dr. Bunting (closing): I have very little more to say. I am much gratified at the discussion of this report. As Mr. Dow has said, the amount of literature to be covered in a report of this kind is enormous; one can only pick out the eight or ten papers and discuss them briefly. I would suggest you select men to make this report year by year who are of different interests and who will pick out the group of papers that most interests them. In this manner the reports will cover a wide range of subjects and will be of interest to the greatest number. I thank you.

USE OF TIN FOIL IN SWAGING

Supplemental to the article by Dr. Henry Barnes, as published in the December Summary, Dr. Barnes says that in swaging he has had excellent results from the use of heavy tin foil instead of cottonoid.

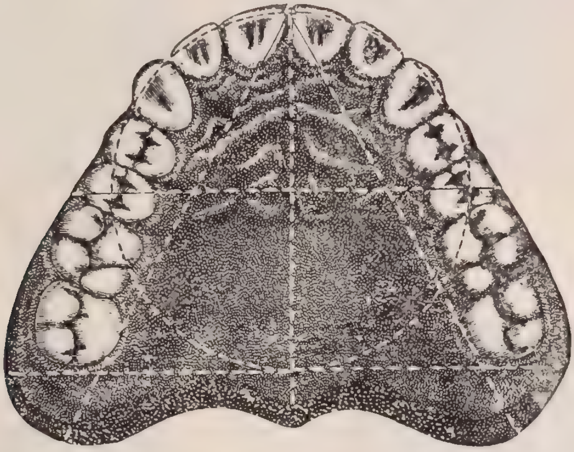
To the method of swaging as given at the bottom of page 960, December Summary, add this note: "Or, wrap model and gold in cavity with heavy tin foil or rubber dam, or both, with rubber over foil. Insert in swager and swage with heavy blows."

NATURE'S HANDIWORK IN HUMAN TEETH

BY DR. L. P. HASKELL, CHICAGO, ILL.

ABOUT FIFTY YEARS AGO, Dr. Bonwill, after the examination of more than one thousand skulls, modern, ancient and pre-historic, of all races, made the discovery that the human teeth are shaped and arranged along geometric lines. He found there is a relative width of the different classes, the centrals, laterals, cuspids, bicuspids and molars. There are no two of these classes the same width. Then he found that the six anterior teeth form the arc of a circle, the radius of which is the width of the central, lateral and cuspid teeth. A circle made of these is set on the incisors; a line through the center of the circle will pass through the center of the first bicuspids and across the posterior margin of the circle will pass across the posterior margin of the second molars. This I have tried on many models of natural teeth.

The illustration is an impression of natural teeth. This can be made of practical value in the arrangement of the artificial teeth by measuring with the dividers, the three teeth indicated making a circle of metal and apply to the incisors, setting the cuspids a trifle outside the circle, as they are the most prominent in nature, and the first bicuspids a little inside the cuspids and then notice where the second bicuspid and molar will naturally meet the circle. In this way symmetry is secured.



Another interesting feature in nature is the fact that the dividers show that the bicuspids and first molar are the same width as the three anterior teeth, central, lateral and cuspid. Also that the perfect set of upper teeth represent an equilateral triangle, the same distance from the median line to the center of posterior margin of second molar.

To sum up, where, in nature, is there more perfect evidence of design than in a set of human teeth?

PORTION OF ILLUSTRATED SURGICAL CLINIC*

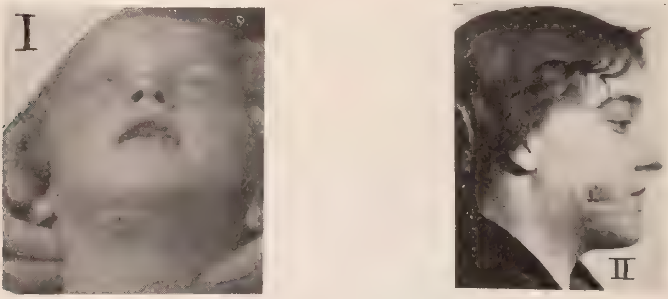
BY C. H. OAKMAN, D.D.S., M.D., DETROIT

ORAL SURGEON HARPER HOSPITAL, DETROIT
PRESIDENT DETROIT BOARD OF HEALTH

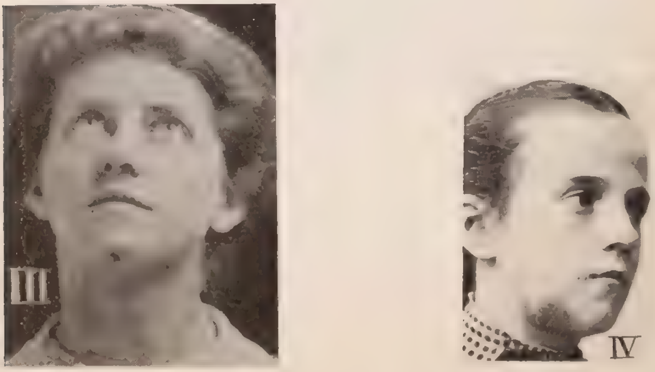
The first five of the accompanying cuts represent cases of facial scars due to ignorance, and neglect of the teeth, combined with poulticing of the face.

Nothing strikes the writer more forcibly than this needless disfigurement of the innocent. No doubt hundreds of similar cases could be found in every large city.

Regardless of all that has been said and written, the practice is still very common.



Result of poulticing face.



Result of poulticing face.

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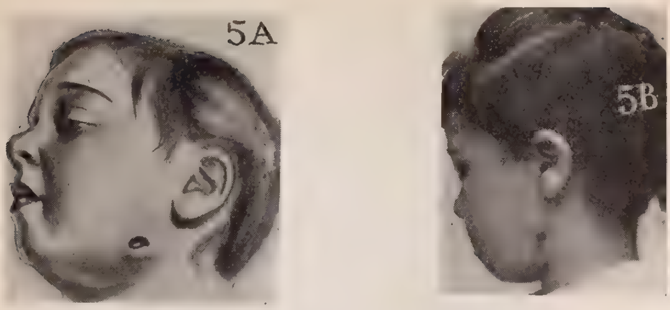
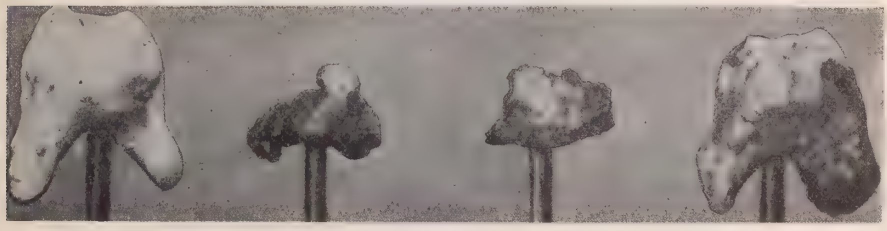
*Presented at the Northern Ohio Dental Society.



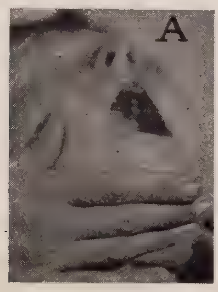
Result of poulticing face.

5A—Before operation 5B—After operation

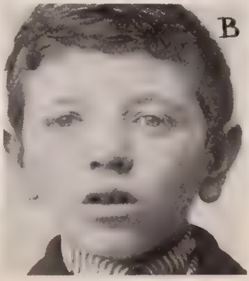
Child, age 6 years. Face poulticed to relieve pain from blind abscess. First operation was done from within the mouth for necrosis, every means was used to save the jaw, but of no avail. Second operation, jaw was removed from angle to cuspid. These operations were not performed until drainage and vaccines proved futile. In the second operation, an external incision was imperative, all of wound could not be sutured; hence unsightly scar.



Patient aged 23 years, complained of distress in region of both antra. The above hypertrophied teeth were found firmly imbedded high in either antrum, covered with serumal calculi; with these were found two pseudo teeth and other tooth germs that were lost during the operation. Patient made a rapid and uneventful recovery.

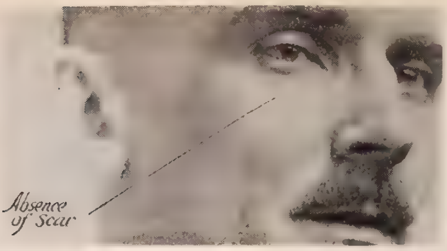


A—Before operation.

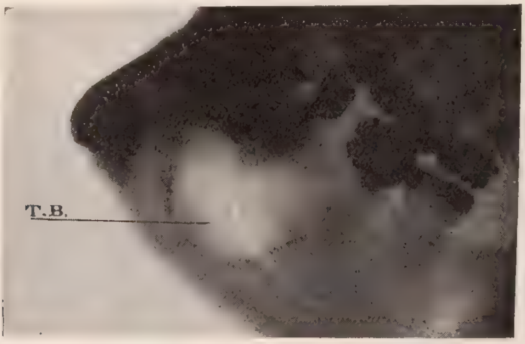


B—After operation.

Giant-cell sarcoma. Child aged 9 years. This case was discovered by a Dental School Inspector. A radical operation was performed; the boy gained in weight and has shown to date no tendency to recurrence. Had this case been neglected the child would in all probability have lost his life.

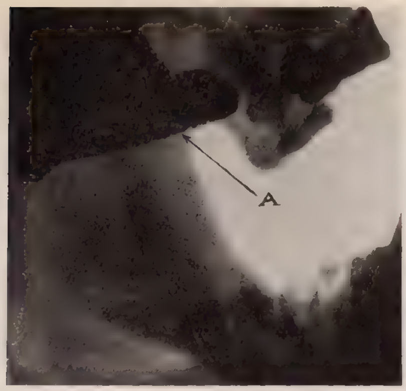


Patient, male, at 38 years; suffered from Tic Douloureux for several years. Local anesthesia was induced in region of the right infraorbital nerve. A transverse incision was made just below the infraorbital foramen; tissue retracted and the nerve drawn out by a tenaculum. An intraneural injection of cocaine and chloretone (one per cent.) was made and before withdrawing the needle a fine catgut suture was thrown around the nerve and tied and the nerve put on the stretch and resected. Immediate freedom from pain and no recurrence after two years. No scarring. One of twelve similar operations.



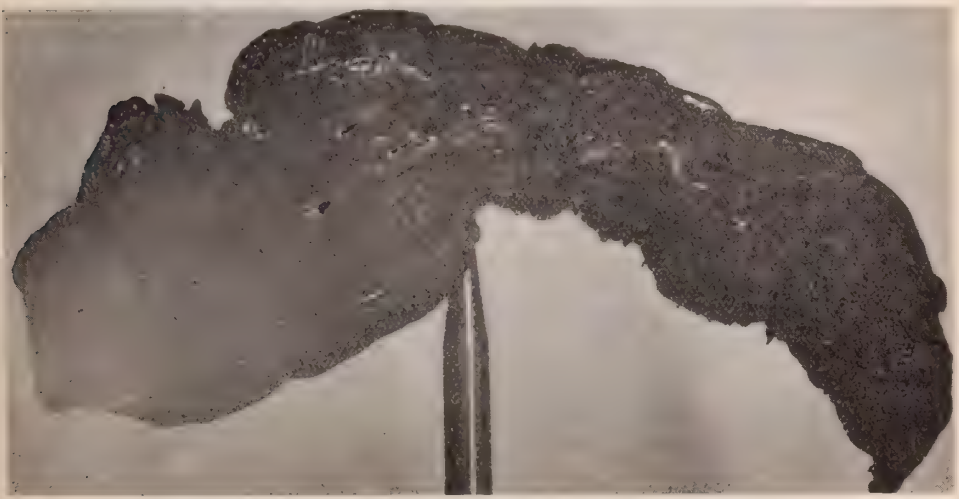
Mrs. S——, aged 27 years; diagnosis tuberculosis. A thorough operation for removal of diseased bone was performed; tonics, fresh air and rest restored the patient to perfect health; two years since operation.

Blastomycosis of lower jaw. Woman, age 35; removal of diseased bone and necrotic tissue, followed by antiseptic dressings and potassium iodide internally; resulted in complete recovery in about six weeks. No recurrence to date—six years since operation. Illustration shows fungus in section of tissue.

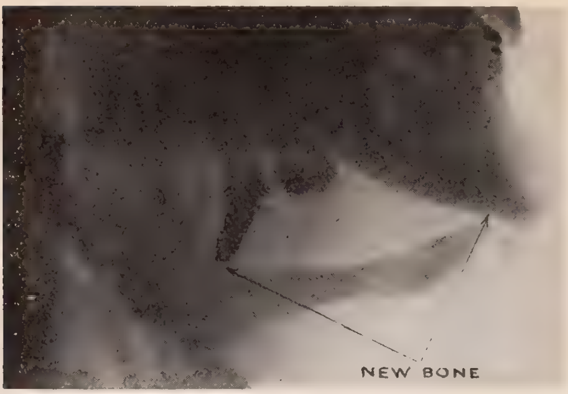


Antral Empyema combined with necrosis, involving Sphenoidal Sinus; extensive operation from heel of right jaw to cuspid tooth. Patient, woman 25 years of age; complained of pain in head, loss of weight and general malaise; unable to work. A—antral plug.

Patient, age 26 years; stated that he could always remove hair from a small opening at the root of the nose; diagnosis congenital dermoid cyst—the skin on bridge of nose was injected with local anesthetic and an incision made the length of the bone; the sac was removed and the soft parts approximated with horsehair sutures. No recurrence after three years. A—Seat of cyst.

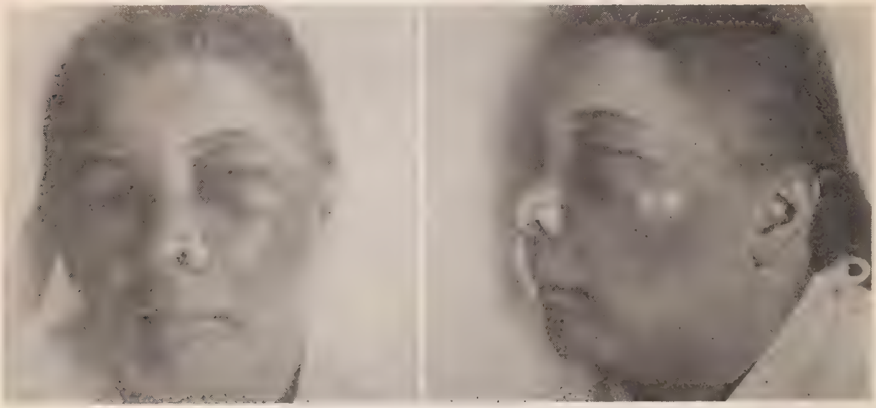


Mrs. ———, aged 40 years; tumor removed from upper lip under local anesthesia, followed by violent hemorrhage from the coronary arteries, which were tied off. This tumor had the appearance of an accordion, so symmetrical were the folds that fell back on the ridge.

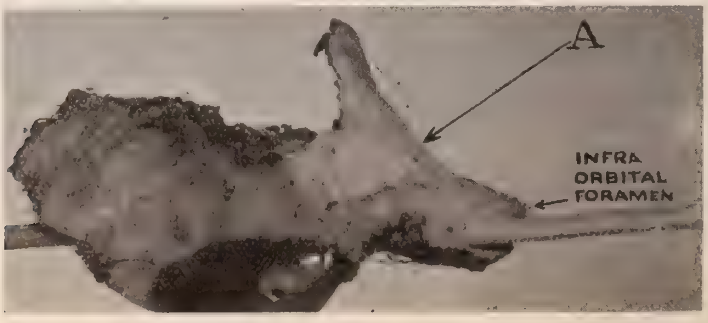


Mrs F——, aged 33 years, underwent operation for necrosis of jaw due to abscess of lower first molar. Two months' treatment with vaccines preceded operation and thorough drainage was established. The jaw was removed from the median line to the angle. Note formation of new jaw. Patient is now wearing denture with comfort and facial expression is very good. Operation was intra-oral.

The new bone represented shows the advantage of waiting for exfoliation without which we could not hope for proper restoration.



Mrs. R——, aged 38 years; suffered excruciating agony due to antral empyema with a marked distortion of face. This case had a septum dividing the antrum into two parts, the upper chamber was no larger than a white bean. This case had been diagnosed as erysipelas. On operation the floor of the antrum was found to be necrotic and was removed (this did not cure) and a few days after an abscess pointed near the infraorbital foramen, an external incision was made and a sequestrum which proved to be the floor of the orbit, was removed.



Mrs. R——, age 38. Sequestrum removed from face. A—floor of orbit.

CORRESPONDENCE

"I'm From Missouri—You'll Have to Show Me"

In the December issue of THE SUMMARY, Dr. Stamper tries to defend himself from his insinuation that he was a grafter because the blowing machine was a better thing to clean the filth out of a patient's mouth than other devices. Cleaning up another person's filth, with either old or improved machinery, does not accord with my idea of professional work. All that any one can do with a compressed air and spray outfit is to clean out loose particles, pus and fluids from beneath the gums. This is all very well and proper if one wishes to do scavenger work with the latest improved machine used by dentists. Call me a mechanic, an artist or a Zahn Artzt, but excuse me from all the scavenger work the patient can do for himself. Blowing the filth out of a patient's mouth at this day and time is away behind the progress the house-cleaning brigade has made. The latest improved machine now in use for that purpose is the vacuum cleaner. Who knows how soon we will be asked to invest in some sort of suction device that will withdraw the filth from a patient's mouth into a receptacle to be emptied by the dentist or his assistant after the patient is gone? I have no desire to do that kind of work, even "without charge." All I do for my patients is finally summed up in the time and energy expended on the case.

We all know how much to believe of what a patient says about another dentist having injured him. Polite patrons never speak derogatorily of another dentist to the dentist who is working for them.

Does Dr. Stamper use no other means in treating his pyorrhea patients than his blowing machine? Does he blow the deposits off the roots of the teeth beneath the gums? I do not believe he can do it. Show me!

I do not accuse a dentist of being a grafter because he uses a compressed air and spray outfit, but so many are making a graft out of the treatment of pyorrhea in the methods used, and a display of costly machinery for that purpose, and the time spent in scaling teeth, feeling around in the blood clots for particles that will be readily found a few days later, all looks in that direction.

I gave my method of treating patients affected with pyorrhea because so many dentists are yet saying there is no cure for it, and others are either ignorantly or knowingly making a graft of the treatment. I have been successful in every case where I could remove the deposits from the roots and could get the co-operation of the patient. If Dr. Stamper will lay aside his blowing machine and follow the instructions given in my article, he will cure his patients as quickly as he does with the machinery he is now using. The patient can clean out his own filth while the dentist is doing work for another patient.

We are only beginning to investigate the cause of pyorrhea, but enough has been learned already that we know the patient's mouth has not been kept clean or the disease would not be present.

Just now we are informed that emetine is a sure cure for pyorrhea, and that the disease is caused by the ameba bacillus. Chiavaro does not believe the ameba is pathogenic. Smith and Barrett believe it is, and so there you are. The ameba may be only a scavenger, feeding upon the bacteria. Emetine may make the bacteria so sick they die as well as the ameba. We know that thymol and formaldehyde are bactericides, and by using them in proper strength we cure persons of pyorrhea. Many other drugs are useful, but it is essential that the roots of the teeth are clean or a cure will not result from any treatment.

Dr. L. West.

Monnett Mo.

THE USE OF NATURAL TEETH IN CROWN AND BRIDGE WORK*

BY HARRY PARR, D.D.S., INDIANAPOLIS, IND.

This clinic consisted of four practical demonstrations in the mouths of that many patients. One natural central and bicuspid, set by means of cast joint, having served a year and each seemed in perfect condition. One lower anterior four-tooth bridge, using the patient's own teeth, cementing them to a sanitary gold saddle, soldering this saddle to post lingual inlays in cuspids. A full upper and lower, using patient's own teeth, on gold plates. The teeth were cemented to posts vulcanized in the rubber. Colors are assumed in the mouth in from two to four weeks.

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*Office clinic, Indiana State Dental Society, 1914.

PYORRHEA SPLINT*

BY DR. A. REITZ, EVANSVILLE, IND.

I have a plain, simple retainer, which is sanitary and neat in every way. Take the cutting edges and grind them in same position as for facing. Take a fissure bur a little larger than the platinum pin which you use in this case, drill two holes in each tooth, one mesially, one distally. Then take pins from porcelain teeth, place one in each hole, letting the heads stick out; put on inlay wax; trim it all around. Make multiple sprue from wire, one point touching over each tooth. Heat, tack to inlay wax, chill and remove; then proceed to cast in the usual way.

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*Clinic, Indiana State Dental Society, 1914.

EDITORIAL

Recent Meeting of the Ohio State Dental Society

The meeting of the Ohio State Dental Society held in Columbus, Dec. 1, 2, 3, 1914, was one of the best ever held and the largest from point of attendance.

The literary program consisted of an address by the president, Dr. J. K. Douglas; a talk on "The Technic for Making Impressions and Models for the Construction of Artificial Dentures," illustrated by moving pictures, by Dr. William A. Giffen, Detroit; an essay on "The Use of Rosin in Operative Dentistry," by Dr. J. R. Callahan; an essay on "The Technic of Conductive Anesthesia," by Dr. Theodore Blum, New York City; an essay on "Conservatism vs. Radicalism," by Dr. W. W. Curtis; an essay on "Diagnosis and Treatment of Trifacial Neuralgia," by Dr. H. W. MacMillan.

The Tuesday evening session was devoted to the subject of "Health Conservation," and talks were given as follows: "A Healthy Citizenship, the State's Best Asset," by Gov. James M. Cox, Columbus, O.; "Essential Factors in Establishing and Maintaining a High Standard of Public Health," by Dr. Homer C. Brown, member State Board of Health, Columbus, O.; " A Thorough Course in Hygiene in the County Training Schools for Teachers," by Hon. Frank W. Miller, State Supt. of Public Instruction, Columbus, O.; "Higher Qualifications for Medical and Dental Graduates," by Dr. W. O. Thompson, president Ohio State University, Columbus, O.; "The Co-operation of Physicians and Dentists in the Conservation of Health," by Dr. J. H. J. Upham, president Ohio State Medical Association, Columbus, O.; Dental Researches of General Health Value," by Dr. Weston A. Price, chairman Research Committee, National Dental Association, Cleveland Ohio.

The Board of Directors voted to affiliate with the Public Health Federation, to support the same financially in an amount not to exceed 15c per capita and made Dr. H. C. Brown the representative of the society on the central committee.

The education and oral hygiene committee was authorized to draw on the treasury in a sum not to exceed $500.00 during the coming year.

Complaint was received that a person, not a licensed dentist, was practicing dentistry in the Mansfield Reformatory. Drs. Brown and Chapman were appointed a committee to present the matter to the Board of Administration.

The program and clinic committees were instructed to place the name of no person on the program who was not a member of the society, if eligible.

A "supervisory committee" was authorized, composed of the secretary and two others, to be appointed, to council with and assist component societies in arrangement of programs and for their general good.

One hundred and ninety-one new members were reported by the various components. Membership will approximate 1,300. Members registered, 572; largest previous registration, 493.

Next meeting place, Columbus, Ohio. Semi-centennial and dedication of Miller memorial. Biggest ever!

Terms of all directors expire with this year; hereafter to be elected, three at large by the society, others by component societies. Officers elected: President, E. C. Mills; first vice-president, T. I. Way; second vice-president, F. M. Casto; secretary, F. R. Chapman; treasurer, S. D. Ruggles; directors, J. R. Callahan, C. I. Keely, J. B. Stewart, H. F. Harvey, J. D. Gordon (to fill unexpired term of M. H. Fletcher, deceased). Delegates to National Association for two years: L. L. Barber, H. C. Brown, L. E. Custer, J. R. Callahan; delegates to National Association for one year: W. A. Price, F. M. Casto, C. W. Mills, E. C. Mills. Delegates to Panama-Pacific Congress: H. C. Brown, W. A. Price and C. I. Keely.

It was a great meeting and the proceedings will be published in full in THE DENTAL SUMMARY.

The following telegram was received during the session of the Ohio State Dental Society:

Jacksonville, Fla., Dec. 2, 1914.

Dr. Homer C. Brown,
Columbus, Ohio.

The American Public Health Association and the National Mouth Hygiene Association have just closed joint session of remarkable interest and enthusiasm. We send greetings to Ohio State Dental Society as allies in the campaign for popular education in mouth hygiene. We agree that hygiene of the mouth has a large place in our united efforts for better personal and public health.

WM. C. WOODWARD, *President*
American Public Health Association
HARVEY W. WILEY, *President*
National Mouth Hygiene Association

A Correction—American Institute of Dental Teachers

The annual meeting of the American Institute of Dental Teachers will be held at Ann Arbor, Michigan, January 26th, 27th, and 28th, 1915, instead of the 27-8-9th as announced in the December SUMMARY.

There will be a number of interesting papers, reports and discussions by prominent dental educators. All dental teachers are cordially invited to be present.

J. F. BIDDLE, *Secretary*

517 Arch Street, N. S. Pittsburgh, Pa.

OBITUARY

IN MEMORIAM

Chauncey Scott Bigelow

Born, September 28, 1862—Died, December 2, 1914

EVERY MAN WHO CAME into personal contact with the subject of this memorial honored and respected him; all who knew him in the closer intimacy of daily life, who stood shoulder to shoulder with him on the "firing line," loved him as it is the good fortune of few men to be loved. By the latter he will be missed daily and hourly—his wise and always friendly counsel; his patient, kindly guidance; his vision, understanding and insight; his modest, unassuming, always constructive criticism; his broad tolerance; his cool, steady courage when storms were threatening; these and a hundred other traits, as fine as they are rare, drew and bound him to his business associates and employes as with hoops of steel.

Never was his voice heard in anger; never was it raised in reproof; contempt, impatience, prejudice were foreign to his nature. Always doing his very best, putting all that he was and all that he had into everything that he did, he gave those about him full credit for the same high ideals with which he was animated; with always doing the best they could do. He had a large measure of that rare quality which enables its possessors to view disputed questions from the standpoint of those who disagree with them.

Knowing his business as only those having his long and intimate experience can know it, he never was "too busy" to drop his own particular part of the daily task to help another, whether that other happened to be the head of an important department or an errand boy. No detail was too small to be worthy of his notice; yet he trusted those to whom had been assigned each particular part of the work. No task was too great for him to undertake in his modest, unassuming way; yet he always was ready to ask, accept and act upon advice.

The simple knowledge that he was at his desk was an inspiring, encouraging, steadying influence. He *knew*, and all about him knew that he knew, and that their problems were his problems, which his larger and fuller experience would enable him to solve for them.

This, and very much more than this, much that can only remain unspoken in the heart, he was to those near him. How he was regarded by his fellows beyond the limited circle of his immediate daily life is well shown by an address delivered by Hon. Frank L. Mulholland, president of the International Association of Rotary Clubs, at a memorial meeting held by the Toledo Club, Friday, December 4th.—*G. E. H.*

Mr. Mulholland spoke as follows:

Mr. President and Fellow Rotarians:

Today we pause from our various activities to pay our tribute of respect to an absent Rotarian. It is my function to voice the sentiment of my fellows, for a moment recall the virtues and the manhood of one who so recently associated with us in the Rotary Club of Toledo, and express our tribute of respect to the memory of one, who, by his genial nature, his strong personality and sterling integrity, won the love and respect of all with whom he came in contact.

Little thought we, when last we met, that in but a day or two we would be called to pronounce a eulogy over the dead body of our fellow and friend, Chauncey S. Bigelow, but he has passed over the great river and is resting upon the other side.

Chauncey S. Bigelow was beloved and honored by all who knew him, and the announcement of his death, which occurred on the morning of Wednesday, December 2d, was everywhere received with expressions of deepest sorrow.

Mr. Bigelow was born in Attica, Indiana, September 28, 1862, making him fifty-two years of age at death. With his father's family he came to Toledo when a small boy and later became a newsboy upon our streets. Here he formed those habits of industry, correct living, and developed the untiring energy characteristic of his subsequent business activities.

With the exception of one year at a school on the Hudson, Bigelow was the product of the Toledo public schools.

Mr. Bigelow's business life reads like a romance. He made himself what he was. He entered the employ of RANSOM & RANDOLPH at the age of sixteen years, beginning as errand boy, bundle boy, janitor, utility man, and at last the president and half-owner of this splendid enterprise. By successive promotions he filled every position offered by his house except that of its accountant.

In 1885 Mr. Bigelow became a partner in his firm, and when the business was incorporated in 1892, became a director, and later its treasurer.

In 1907 both Mr. Ransom and Mr. Randolph died, and Mr. Bigelow became president of the company. This position he held until his death. If you want to know the business character of a business man, ask his associate. I inquired of Floyd Crandell. Listen to what he answered: "I was associated in business with Chauncey Bigelow for twenty-six years and eleven months. We never exchanged a harsh word: we never had a misunderstanding. He had the best of dispositions; his was one of the finest characters; he possessed the highest ideals; was straightforward, frank and honest in all of his dealings."

When success came to Chauncey Bigelow, he remained the same conscientious, hard-working, friendly man, always faithful, conservative, and honest, so that when he died all men said that he had lived a life above reproach, with integrity that was unimpeachable.

His pleasing personality made him popular with all with whom he he came in contact. He was loved and respected by his associates in the business world, and when he died they paid splendid tribute to his memory. Scores of letters and telegrams have poured in, expressing sorrow at his death and sympathy for those whom he has left behind. Today, in his late home, rests the mortal remains of Chauncey S. Bigelow, amidst a bower of fragrant blossoms placed upon his bier by the hands of loving friends from Boston in the East to Kansas City in the West.

May I again refer to his closest friend and business associate, Floyd Crandell? I asked Floyd to stop at my home last evening to discuss with me what I should say to you upon this occasion. He called at the door of my home, and with broken voice said that he had written what he would say, handed the paper to me and hurried away. This is what I read upon the paper: "Personally I have lost a brother in every sense of the word. We were practically inseparable so far as our work and daily associations were concerned, and the blow is crushing. I did not realize how much I leaned on him, nor how much I enjoyed his leaning on me. My heart is full, and while I would love to meet with you at the club tomorrow and say what is in my heart, I cannot be with you; nor could I tell you how much I loved him and shall miss him, if I were there. Those closest to him realize his sterling worth and know that we have suffered an irreparable loss."

Words would not befit us at this time to express the grief which we feel. His was a life which left imprinted on the community a memory of time well spent, of work well done, which made friends who will hold his memory dear so long as friendship's ties can last.

Chauncey Bigelow's domestic life was ideal. He was a man who thought an almost indefinite amount of wife and children. His devotion to them was without flaw or blemish. This was indeed a happy circle. The entire family shared in the genial and sunny disposition of the father. He was open and generous to a fault, and never so happy as when, at the close of the business day, he returned to wife and children.

But the course of this splendid life was not to run thus smoothly. On the morning of December 2d, he suddenly and apparently without warning was stricken by the dread summoner, and taken from this life into the life which fadeth not, neither doth it die.

To the bereaved family of our departed brother we extend our deepest sympathies, and bow our heads with sympathetic woe, with those whose hearts' ties have been thus rudely broken. Deep as is our sorrow, theirs is the acutest grief. Bitter is the cup of the loved ones who saw the father, husband, go down into the "Dark Valley of the Shadow of Death."

They miss, as no others can, the smiling face and the cheering voice of Chauncey Bigelow, but today as with loving thoughts and cherished memories we recall this dear one gone, and endeavor from his virtues to develop our lives in the best and noblest and truest sense, we know that "To live in the hearts of those we leave behind is not to die."

"Again a Prince has fallen in the fight—
The val'rous champion of truth and right;
Determined, honest, level-headed, just—
Who broke no promise, nor betrayed a trust;
His genial face with courtly kindness beamed,
By friends beloved, by all mankind esteemed.
Peace to his manly soul, and sweetest rest,
With that glad throng whom love of God has blest!"

Chauncey S. Bigelow is dead. The unsolved and the unsolvable mystery has enveloped him. He has passed from our midst and will never more be known to men. These eyes will never again behold him; his hands will never again grasp ours in friendly greeting.

Death is not a stranger. He has visited every home. He has knocked, or will knock, at every door, and neither love nor knowledge, nor power, nor any other thing can bar his entrance. He is no respector of persons, and the wise and the foolish, the great and the small, the rich and the poor, the famous and the obscure, He treats with merciless impartiality.

From the earliest days of the world's youth, when the morning stars first sang to God, and Eden's bowers were filled with the divine melody of a thousand feathered songsters, and every bud, blossom and petal gave forth grateful perfume of adoration and love to the Creator of the Universe; when the first man looked into the cold and pallid face of the first dead human being, down to this moment, man has called aloud in his agony for some response from the loved ones who have passed into Eternity—but the only answer is the echo of his own wailing cry. We all know that either today, or tomorrow, the Grim Reaper will call and strike us from the roll of the living. From the voiceless lips of the unreplying dead there comes no word, but in the night of death, "Hope sees a star and listening love can hear the rustle of an angel's wing."

But yesterday the living, moving, sympathetic, generous friend, and now, alas, but a memory.

But what a memory Chauncey Bigelow will leave to us. A memory of his generous acts; a memory to all who knew him--his noble attributes of heart and mind; a memory of a life which left its impress upon fellow men, for nobility of character, a memory of his business and private life which furnished an example worthy of emulation by all; a memory which cannot entirely fade, and which must influence for good all who came in contact with him.

He is gone. Affectionate brother, respected citizen, devoted busband, loved father and trusted friend. The widow and children mourn, and their grief is our grief. To them we can say nothing to lighten their sorrow, but our earnest prayer to God the Father, is that Heaven's choicest blessings may ever rest upon them.

My fellows, I have done. A little while and we will go back to the duties of our several callings, but by this experience we are admonished, as we have been oft before admonished, of the uncertainty of life, the immutable certainty of death, and the vanity of all things human. Decrepitude and decay are stamped upon every living thing. The cradle and the grave are near neighbors, and it is a lamentable and melancholy truth that no sooner do we commence this earthly pilgrimage than, at the same time, we begin to die.

We grieve for our departed brother, but our grief is softened by the faith that some day on the illimitable shores of time we shall again grasp his hand and look into his eyes, and know that his heart, vibrating with fraternal love, beats for us as in the days of old, and that with hand clasped in hand, we will again join in the grand chorus of "Auld Lang Syne."

As we depart from here, let it be with holy thoughts and tender memories; resolved that by the force and strength of this man's unseen but all-pervading influence, we may shape our lives so that when we are summoned and brought to render an account of our stewardship, we may sink as softly to our eternal sleep, our souls replete with happiness and the consciousness that we have done our full duty, and that the world is better for our having lived.

With character as the basis of our fellowship; with sincerity as the cornerstone of our sociability, we will be pure for those who care; we will be strong, for there is much to suffer; we will be brave, for there is much to dare; we will be friends to all—the foe or friendless; we will give and forget the gift; we will be humble for we know our weakness; we will look up—and laugh, and love, and lift.

FRANK L. MULHOLLAND.

Ann Arbor, Mich., Dec. 12, 1914.

To The Ransom & Randolph Co.,
Toledo, Ohio.

The Dental Faculty of the University of Michigan learns of the sudden and untimely death of Mr. C. S. Bigelow, the honored president of your firm, with deep regret, and at a meeting this date, unanimously adopted the following resolution, which I am directed to convey to you:

Resolved: That in the death of Mr. C. S. Bigelow, president of The Ransom & Randolph Company, of Toledo, Ohio, we realize that a devoted and sincere friend of the dental department has been taken from us. We are reminded of the many personal kindnesses and of his constant endeavors to co-operate with us in an effort to establish the work of this school on a high educational basis, and we shall ever hold in grateful remembrance the many expressions of good will and of his personal interest in our Institution. Our cordial sympathy is herewith extended to his associates, in the loss of an able leader and sincere friend.

DENTAL FACULTY, University of Michigan.
By N. S. HOFF, *Dean.*

Wm. Ernest Walker, D.D.S., M.D.

Born March 3, 1868, in New Orleans, La. Son of J. R. Walker, D.D.S., who practiced dentistry in New Orleans up to the time of his death in 1887, and Jeanie Mort, best known to the profession as "Mrs. M. W. J." under which *nom de plume* she contributed many articles to the various dental journals, particularly a department which she originated and called "Practical Points," in the *Dental Digest.* She died in 1907.

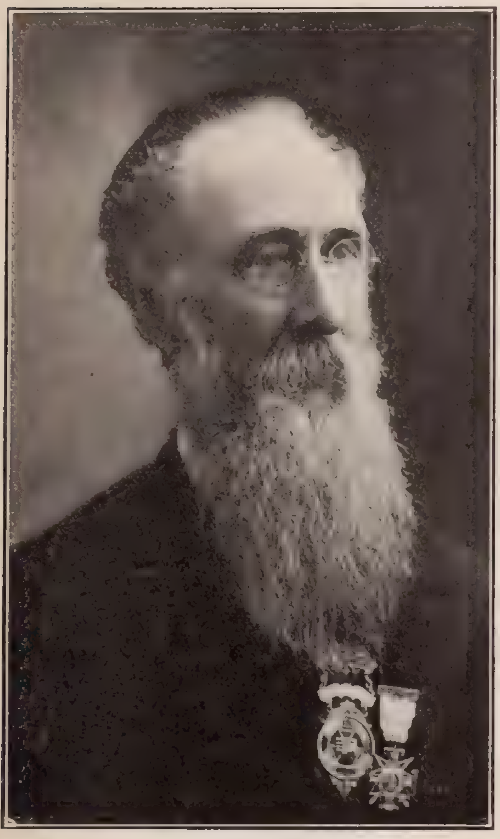
Dr. Wm. Ernest Walker attended the public schools of New Orleans and studied dentistry in his father's office, later graduating with honors from the Baltimore College of Dental Surgery in 1889. He opened his first office at Bay St. Louis, Minn., later moving to Pass Christian, Minn., where he enjoyed a large practice. While practicing at Pass Christian he filled the chair of Clinical Dentistry at the Dental Department of the Southern Medical College in Atlanta, Ga., at the same time taking a medical course.

After two years spent at the college in Atlanta, he became connected with the Richmond College of Physicians and Surgeons, occupying the chair of Operative Dentistry, while completing his medical studies. After obtaining his M.D. degree, he resigned his professorship in order to devote all his time to practice.

Becoming more and more interested in orthodontia, he finally moved to New Orleans about twelve years ago, giving up the general practice of dentistry and limiting his practice to orthodontia and facial orthopedia, in which specialty he was remarkably successful. During the first few years of orthodontic practice in New Orleans, he was Dean of the New Orleans College of Dentistry, where he also taught orthodontia. His death was quite unexpected, the result of uremia, following an illness of one week.

He is survived by two sisters, Mrs. S. A. Allis, of Leesville, La., and Mrs. D. P. Allen, of Beaumont, Texas, and one brother, J. Mort Walker, an officer of the Commercial Germania Trust & Savings Bank of New Orleans.

At the time of his death he was secretary and treasurer of the American Society of Orthodontists, member of Sigma Delta Sigma fraternity, and numerous local, state and national dental and medical associations. He was first to point out the anatomical fact of the downward and forward movement of the condyles and invented the first anatomical articulator, which reproduced the motion of the mandible; as also a number of appliances which he used in the practice of his chosen specialty.



Charles Richard Butler

IN THE passing of Charles Richard Butler, the dental profession loses one of its most esteemed members. The public loses one, who, for more than sixty years, rendered humanity most excellent service.

Charles Richard Butler was born in Portage county, O., June 28, 1832. His early life was spent on a farm and later he became a brass and bell founder. When quite young he began the study of dentistry and medicine as a student of Dr. M. L. Wright, of Cleveland. After three years of pupilage and practice, he was fortunate in being taken up by that enthusiastic and incomparable teacher, Dr. W. H. Atkinson, who fathered him as a student, assistant and partner. Dr. Butler became known the country over as "Charlie," sometimes "Charlie Butler." In 1858 he was graduated from the Pennsylvania College of Dental Surgery, and in 1865 graduated from the Cleveland (W. R. U.) Medical College.

He was taken by Dr. Elisha Sterling as an assistant in general surgery, becoming as well coached in the technic of general surgery as in dentistry, in which he was ranked with the most skillful operators in the dental profession.

Dr. Butler was one of the charter members of the Ohio State Dental Society, which was organized in 1866, and was next to the last of the charter members to pass away.

He was president of the Ohio State Dental Society in 1875; president of the American Dental Association in 1888; president of the Cleveland Dental Society and an active worker in these and the Northern Ohio Dental Society.

He served on the Ohio State Board of Dental Examiners from 1874 until 1892. In 1886 he was elected a member of the Board of Directors of the Ohio State Dental Society, and continued to serve in that capacity up to the time of his death.

Dr. Butler designed and gave the profession a number of instruments; plug finishing burs, mallet pluggers and excavators, many of which are still in use.

His ability and love for doing fine work led him to the study and mounting of precious stones. Many close friends have much enjoyed viewing the product of his avocation and will long remember the enthusiasm and fondness with which he would show his collection.

Dr. Butler served his profession well as an ardent worker in our societies, while at the same time he rendered his clientele most valuable service. The man will long be remembered, for he was a most kindly, courteous and cheerful Christian gentleman. We regret that we shall no more see his face in our midst but we are thankful to have known him. His death occurred on December 15th, after a few hours' illness.

He was a Knight Templar, and thirty-third degree Scottish Rite Mason, and his funeral on Friday, Dec. 18th, was in charge of the Commandery at Cleveland.—*H. R. C. W.*

Dr. Ezra Sprague Holmes

Dr. Ezra Sprague Holmes, the oldest dentist in the United States, founder and since 1885 president of the Kent Scientific institute, and since 1865 a resident of Grand Rapids, died November 11 at the Reed's Lake sanitarium. For several months he had been in failing health at his home, 147 Waverly place, S. E., whence he was taken to the sanitarium Friday. His age was 95 years, and is survived by a daughter, Miss Jennie Holmes, who lived with her father,.

He was born in Lockport, N. Y., July 15, 1819.

He was president of the Grand Rapids Dental society for two terms, and the organization has long been known as the E. S. Holmes Dental club, in his honor. He was president of the State Dental society for two terms, and a founder of the Kent County Sportman's club, which had its camp on the "island," and which later broadened into the Michigan Sportman's society and drafted most of the game laws for the state.

A devotee of science, he organized the Kent Scientific institute by rejuvenating two scientific societies here and since 1885 he had been its president. He was instrumental in the foundation of the museum, and always closely allied with its fortunes.

He had been an invalid since January, 1914.

Dr. George Edwin Hunt

Whereas, Our Heavenly Father has seen fit to remove from earthly activity our friend and advisor, Dr. George Edwin Hunt, we take advantage of this, the first meeting of the First District Dental Society since his departure, to record his death and express in inadequate words our sorrow over his loss, and

Whereas, By his wit, his knowledge, his wonderful sympathy with and understanding of humanity, he has been a great influence for good, particularly among his brothers of the dental profession; so he is a great loss to them and all humanity.

All this and much more being true, let it be

Resolved, That we, the members of this First District Dental Society of Indiana, have sustained a loss that cannot be repaired, a grief that only time can soften, but we have an example that can brighten and benefit the lives of all who knew him and through them, all those who did not. Be it further

Resolved, That these resolutions be spread upon the minutes of this society and a copy sent to his widow, THE DENTAL SUMMARY and *Oral Hygiene*.

November 12, 1914.

W. G. DOWNS,
J. O. ZUBROD,
J. M. HALE.

Platinum Production

Although the high price of platinum encouraged prospecting in the United States in 1913, says David T. Day, in an advance chapter from Mineral Resources, 1913, on the production of platinum by the United States geological survey, the expected increase in the production of crude metal was not realized. The total production from California and Oregon, the two sources of platinum ore in this country, amounted to 482.87 crude ounces and was valued at $18,477.

A considerable output of platinum is also obtained in the United States from the refining of gold and copper bullion. A portion of this platinum originates in old scrap, sweepings, etc., sold by jewelers and dentists. About 650 fine ounces, however, was derived in 1913 as new metal from gold and copper bullion from domestic mines. The production of refined platinum in this country in 1913 from domestic sources was 1,034 troy ounces, valued at $46,530, against 1,005 troy ounces, valued at $45,778, in 1912.

Russia has been the greatest producer of platinum in the world, the output of crude platinum in 1913 being 250,000 troy ounces.

The value of platinum imported for consumption in the United States in 1913 was $5,040,210, against $4,503,682 in 1912.

In late years platinum has come into greater use in the jewelry trade, but this increased demand has been compensated for by the decreased use of the metal for electric light bulbs.

SOCIETY·ANNOUNCEMENTS

Greetings From the President

To the Officers and Members of the Components of the Ohio State Dental Society:

As the newly elected president of the Ohio State Dental Society, I take this opportunity to extend you a cordial greeting and an expression of thanks for the mark of confidence in favoring me with this honor.

It seems a custom, established by precedence, that the president of a state society, with an occasional exception, go into seclusion after his election and there remain until the following annual meeting. I desire to sidestep these conventionalities and take an occasional opportunity to call your attention to matters which, in my mind, seem important to the conservation of our interests.

The component societies are ever to be regarded as our pillars of strength, and their maintenance must be rigidly safeguarded. Too liberal a policy cannot be exercised in contributing such support to their meetings as will make them a fruitful source of benefit to the members, thereby creating an increased attendance.

The necessity of a close relation between the components and the state society along this line cannot be too strongly urged; the Organization Committee has been discontinued, but the creation of a new committee, to be known as the Supervisory of Components, should be appealed to, through the state secretary, on matters pertaining to the welfare of component societies.

Enthusiasm, harmony and goodfellowship prevails throughout the sisterhood of components to a decided degree. Much remains, however, to be accomplished in public dental education and oral hygiene. With the new Legislative Committees appointed in the components, in accordance with a resolution adopted at the last session of the state society, legislative matters long needing attention can be handled more efficiently, and this committee in the state society will keep these committees in close touch, and hearty co-operation will be expected.

Throughout the jurisdiction of the component societies there are many worthy and eligible men whose membership would be desirable; a recent systematic effort of the Membership Committee in the state society, in conjunction with similar committees in the components, brought in almost two hundred names that had never before appeared on our roster. This emphasizes the importance of a closer co-operation of the local and state committees along the several lines, and we are hoping relations of these respective committees will increase and be more effective than heretofore.

A resolution entitling a component with a membership of twenty, to a member on the Board of Directors in the state society, should stimulate our smaller societies, that all may be duly represented on the board that will be created in December next.

It is the prerogative of any member of the state society to suggest or inquire into any matters connected with the society, and it is hoped each member will bear in mind his co-operation is as important in the state as in his local society, that its best interests may be safeguarded and its prestige be maintained.

To the end that suitable literature be available and every assistance be given the membership in preparation of papers for programs, I strongly advocate the establishing of libraries in the jurisdiction of each component society, same to be housed in public library buildings when possible. Bound volumes of half a dozen leading journals extending back some ten years, with a few of the latest works on various dental subjects, would form a good working library. The Ohio State Dental Library, while almost complete in itself, has thousands of duplicate numbers of journals and is still soliciting material to be used in completion of files of journals for these local libraries. Some of the components have already taken steps in this direction, and any communication relative to this or any other matter should be addressed to Dr. F. R. Chapman, secretary of the state society, who will refer the matter to the proper committee, and I may add, each committee this year is a live one.

We are approaching the fiftieth year in the history of our State Society, and the December (1915) meeting will be our *Golden Anniversary*. Probably no other state society has furnished such a galaxy of names and pioneers whose life work has left such a permanent imprint on our profession, and anything short of a suitable program would be a repudiation of the work they accomplished for our society and achieved for the profession generally. The unveiling of the American Miller Memorial will also take place during our next meeting, and will be an occasion on which the profession of every state in the Union will do honor to the memory of one of Ohio's sons. Either of these occasions would demand the best program that has ever been produced; together they will command an unusual attendance, not only from our own state but from the best in the profession throughout the country.

With the foregoing in mind, the year 1915 cannot be an idle one in our history; much remains to be done, so let us collectively and individually, strive for the perfection of our present organization, increasing our efficiency and establishing for dentistry that prestige which its importance merits.

EDWARD C. MILLS.

Columbus, Ohio.
151 East Broad Street

Michigan—Eighth District

The Eighth District Society of Michigan held their annual business meeting and election of officers for 1915 on December 11, 1914, in Saginaw, at the Fordney Hotel.

An elaborate banquest was served, after which the following officers were elected: B. F. Miller, Jr., Flint, president; W. E. Moore, Saginaw, first vice-president; John Schindler, Bay City, 2d vice-president; J. H. Taylor, Flint, secretary and treasurer.

Following this Dr. E. T. Loeffler, Professor of Therapeutics of the University of Michigan, read a very interesting and instructive paper on "The Advantages and Disadvantages of Pain; Its Value as a Diagnostic Symptom and Methods and Means for its Relief and Prevention in all Surgical Operations." Discussions were freely entered into by the members and also several of the medical profession, who had been invited to attend the meeting.

The sum of $25.00 was voted to the aid of a state lecturer on Oral Hygiene, and petitions signed by all present to be presented, one to the Chairman State Board of Health and one to Governor Ferris, in behalf of the Oral Hygiene campaign.

Dr. Morgan, of Saginaw, provided the tables with a very liberal supply of delicious and beautiful apples, grown in his orchard near the city, Steel Reds and Rhode Island Greenings being the predominating varieties. He was given a vote of thanks for his thoughtfulness and generosity. Dr. Meisel, of Bay City, also received a vote of thanks for the use of his beautiful motor boat, the "Florence M.," at our annual outing on August 15, 1914.

Thirty-two members of the society from Bay City, Saginaw, Flint, Midland, St. Louis, Shepherd, Mayville and other places attended the meeting; also a goodly number of practicing physicians of Saginaw.

The meeting was considered one of the best ever held by the society.

C. F. Adams,
Sec. Eighth District Dental Society.

Oklahoma State Dental Society

The next meeting of this society will be held in Oklahoma City, March 15, 16, 17, 18, 19, 1915.

The meeting will be conducted somewhat along the same lines (the post-graduate plan) that has proven so valuable in this state the past few years.

The principal lecturers will be Drs. J. H. Prothero and W. H. G. Logan, of Chicago. Dr. Prothero's lectures will be confined to important phases of Prosthetic Dentistry, while Dr. Logan will give lectures on modern methods of treating pyorrhea and local anesthesia.

Reputable dentists from out of the state are welcome to this meeting, but are required to pay a fee of five dollars for the lectures and clinics.

Enid, Okla. C. R. Lawrence, *Secy.*

Minneapolis District Dental Society

The Minneapolis District Dental Society will hold its annual meeting on February 11, 12, 13, 1915, in the City Hall, Minneapolis.

The first two days will be devoted to progressive clinics, papers and exhibits and the third day to an office-to-office clinic.

Everything points to a most successful meeting, so reserve the time now.

DR. HARRY W. NELSON,
Secretary.

Michigan State Dental Society

The annual meeting of the Michigan State Dental Society will be held at Grand Rapids, April 15, 16 and 17, 1915. One of the best meetings ever held in the state.

F. WARD HOWLETT,
Jackson, Mich. *Secretary.*

Chicago Dental Society

The annual clinic of the Chicago Dental Society will be held in the Hotel La Salle, January 29 and 30, 1915.

The officers and committees are planning a program for this meeting, which they feel sure will be of interest to every dental practitioner who can arrange to be in Chicago at this time.

T. L. GRISAMORE, *President*
P. B. D. IDLER, *Secy.*

Connecticut State Dental Association

The fifty-first anniversary of the Connecticut State Dental Association will be held at Hartford, April 20, 21 and 22, 1915.

CHAS. H. RIGGS, *President*,
Hartford, Conn.
E. R. BRYANT, *Secretary*,
New Haven, Conn.

National Association of Dental Faculties

The National Association of Dental Faculties will hold its meeting on Monday and Tuesday, Jan. 25th and 26th, 1915, at Ann Arbor, Mich. Headquarters, Allen Hotel. This meeting will precede the Teachers' Association meeting, which will be held Jan. 28th to 30th. Besides the regular business there will be several papers of interest to educators read before the association. The Executive Committee meets at nine o'clock, on Tuesday, January 26th. Regular session will open at ten.

B. HOLLY SMITH, *Ch'mn Executive Committee*
CHAS. C. ALLEN, *Sec'y*

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

OHIO--STATE

Dr. Truman W. Brophy's Clinic at St. Francis Hospital

There is a mite of a boy, aged 4, in St. Francis Hospital, whose mouth was made over yesterday, while a group of dentists and surgeons looked on. When this little boy woke, after a long time in chloroform sleep, he had something he didn't have before—a palate. And when two secondary operations have been performed, one to correct a harelip, his anxious parents are promised that he will be as whole as any other boy and can go right ahead and learn to talk and to do other things normally.

The operation which produced the palate where only a cleft had been was that performed by Dr. Truman W. Brophy, Chicago. It was a long process, consuming nearly an hour, and Dr. Brophy was busy orally—explaining his movements to the spectators—the while he was busy with his hands and numerous instruments. But it was all very smooth and systematic. While the baby patient was being prepared and the anesthetic administered, Dr. Brophy lectured concerning the possibilities and the advances made in oral surgery.

"It is a crime to allow children with such congenital deformity as cleft palate and harelip to go through life without being cured, when the cure is, after all, such a very simple matter," said Dr. Brophy. "The cure is most easily accomplished when the baby is three months old or less. The operation is considerably more complicated in this boy of four years, for the deformed bone cannot be bent into shape, but must be fractured. The shortest time in which I have performed this operation was 17 minutes."

When the patient was ready, Dr. Brophy exhibited the cleft palate and deformed lip, then showed the abundance of misdirected tissue which must be drawn down from its unnatural course to form the palate. The work of transformation then began, several different instruments being used. The concluding step was to bind the tissue together as a palate, lead plates—acting as splints—horse hair and silver wire being used. These must remain until the palate is made firm by natural growth.

"When all is done," said Dr. Brophy, "this little fellow's palate will be as normal as any, with not so much as a scar to indicate it ever was otherwise."—*Ohio State Journal*, December 4.

Ohio—State

Columbus, Dec. 3.—The Ohio State Dental Society which closed a three days' meeting here today, elected the following officers for the ensuing year:

E. C. Mills, Columbus, president; T. I. Way, Cincinnati, first vice-president; F. M. Casto, Cleveland, second vice-president; F. R. Chapman, Columbus, secretary, and S. B. Ruggles, Portsmouth, treasurer.

The directors are J. R. Callahan, Cincinnati; C. I. Keely, Hamilton; J. B. Stewart, Cincinnati; H. F. Harvey, Cleveland, and J. D. Gordon, Cincinnati. The delegates to the national congress to attend for two years, are: L. L. Barber, Toledo; H. C. Brown, Columbus; L. E. Custer, Dayton, and J. R. Callahan. Cincinnati; and for one year, W. A. Price, Cleveland; F. M. Casto, Cleveland; C. W. Mills, Chillicothe, and E. C. Mills, Columbus.

The meeting was one of the most successful, interesting and largely attended in the history of the society. Some of the papers are printed in this number; others will appear in due time.

Ohio—Dental Examination in Tiffin

Tiffin, Ohio, Nov. 11.—The Tiffin Board of Education has accepted the offer, made by the Seneca County Dental Association, to examine teeth of school children free of charge.

Mansfield Dentist Held as Spy

Mansfield, Ohio, Dec. 1.—Dr. F. N. Seeley, a former dentist of Mansfield, has been held in an English prison for the last two months as a German spy, according to word received here. The case has been taken up with Secretary of State Bryan.

Badly Smitten

She—"I must leave you here. I'm going to have a tooth extracted."

He—"Oh, I think I'll have one taken out too."—*Fliegende Blaetter.*

Indiana—First District

Evansville, Ind., Nov. 13.—The First District Dental Society, which held a two days' session here, elected the following officers: President, Victor Knapp, of Evansville; vice-president, J. M. Hale, of Mt. Vernon; secretary and treasurer, A. J. Kimm, of Evansville. A motion was adopted that a delegation be sent to Vincennes, Ind., to organize a dental society in the second district. A clinic was held, in which Dr. F. R. Henshaw, of Indianapolis, participated, showing the use of conductive anesthesia.

Kentucky—Jefferson County

Louisville, Ky., Nov. 20.—With members of the Bluegrass Dental Society as guests of honor, the Jefferson County Dental Society last night held a special annual meeting and banquet at the Tyler Hotel.

The visitors were headed by their officers, Walter Matthews, W. F. Walz, Paul Prewitt and Garnett Smith.

After radiographs of root canal fillings had been shown all present joined in a discussion of this branch of work. These pictures were from life and showed fillings which had been made by dentists in several cities of the state.

The following officers were elected for the year: E. H. Torsch, president; C. S. Pearcy, vice-president; J. E. Johnson, secretary, and B. G. Reese, treasurer. W. M. McCall, the retiring president, presented his annual report, which was approved.

Tennessee—Chattanooga

Chattanooga, Tenn., Nov. 22.—The annual business meeting of the Chattanooga Dental Society was held Friday night, during which the following officers were elected: President, William F. Stone; vice-president, N. C. Hunt; Secretary, I. R. Stone; treasurer, George W. Wagner.

A paper read by Dr. Robert S. Henry on vaccine therapy in oral infections provoked much interesting discussion.

The society is planning to give semiannual banquets at which dentists of national reputation will be invited to deliver scientific addresses.

Texas—Dallas

Dallas, Texas, Nov. 19.—At the regular meeting of the Dallas Dental Society, the following officers were elected for the ensuing year: R. L. Wheless, president; S. L. Barron, vice-president, and P. C. Baird, secretary and treasurer. A. L. Frew read a very interesting paper on dental surgery.

A new hall of dentistry for the Iowa State University is to cost $100,000.

Illinois—Morgan County

Jacksonville, Ill., Oct 16.—Following are the officers elected today by the Morgan County Dental Society: President, Charles Hopper; vice-president, C. B. Sawyer; secretary and treasurer, A. B. Applebee. Another meeting is to be held in January.

(By mistake this report was credited to Florida in December issue.)

Wisconsin—Milwaukee

Milwaukee, Dec. 2.—The Milwaukee Dental Society held its annual election of officers Tuesday night at the Hotel Pfister. Adolph Gropper was elected president. Other officers are: Vice-president, Charles Hall, and secretary-treasurer, R. C. Gruettner. P. W. Rood, A. C. Hacker and H. C. Nickels were named members of the board of censors.

Wisconsin—Northern

Duluth, Wis., Dec. 2.—The Northern Wisconsin Dental Society was formed at a meeting last night. Plans to unite the dentists of all northern counties of the state into a strong society which will meet in a mid-winter clinic at Superior were completed.

After the adoption of the state society's constitution and by-laws, Dr. J. L. Malone, president of the old society, named a membership committee consisting of J. M. Donahue, B. B. Griffin and Fred W. Gordon. This committee is making arrangements to enlist every dentist in this part of the state within the prescribed bounds of the new society.

The dentists are planning a clinic to be held in Superior shortly after the first of the year. The clinic will be the first one ever held in Superior, and is expected to attract many dentists from Duluth, the Twin Cities and towns in northern Minnesota. Officers of the association, including President Malone, D. H. August, vice-president; A. G. Fee, secretary, and F. S. Lawson, treasurer, will compose a committee to work out the program for the clinic.

Missouri—Dental Board Appointment

Jefferson City, Mo., Nov. 24.—W. A. Roddy, of St. Louis, today was appointed a member of the state dental board by Governor Major to succeed Dr. T. E. Turner, of St. Louis, who was killed recently while cranking his automobile Roddy's appointment is for the term ending on September 6, 1915.

When the dentist tells you to open wide your mouth because he isn't going to hurt you, you can begin to understand what profession Ananias followed.

Oregon—Society for Dental Education

Portland, Ore., Nov. 9,—The Oregon Society for Dental Education, organized for the recent legislative campaign, is to become a permanent organization. It has been suggested that the society be made an auxiliary of the National Mouth Hygiene Association, of which Dr. Harvey W. Wiley is president. The new organization will co-operate with the Visiting Nurse Association, the Congress of Mothers and other welfare societies, by giving lectures on the proper care of the mouth. Toothbrush drills have been established in schools here. In Pendleton the society is arranging for a free clinic. Dentists in Eugene have volunteered their services for examining the teeth of school children.

Alabama—Hunstville

Huntsville, Ala., Dec. 10.—At the annual election of the Huntsville Dental Society last night, the following officers were elected: C. W. Kranz, president; George H. Heymann, vice-president; I. B. Wyatt, secretary-treasurer.

Forsyth Infirmary Opens

Boston, Dec. 2.—More than 100 children were treated yesterday at the new Forsyth Dental Infirmary on the Fenway, when it opened its doors for business.

By the beginning of the new year, the officials of the institution believe that everything will be arranged and the infirmary will be able to care for fully 500 patients a day. Sixty-eight chairs will then be in use.

Today the first throat operation will be performed. Besides the regular dental work, the institution will eventually examine the entire breathing tract of all the children coming for treatment. In this way every ailment of mouth, throat and nose will be corrected.

Rotarians Help City

Rotarians everywhere will be interested to know that the Rotary Club of Moline, Ill., has launched its first great work for the betterment of their city.

To equip a dental office in the new high school building, to have a good dentist on hand at all times, is the plan of the club, to thus furnish all necessary attention to the teeth of those children whose parents are unable to foot dental bills. The proposition was presented by C. H. Maxson, superintendent of schools, who is a Rotarian. The Rotary Club of Moline has been affiliated with the national body only two weeks.

A Fake Dental School

Philadelphia, Pa., Nov. 22.—A fake dental school, in which innocent and guileless men may obtain an artistically-engraved diploma at prices to suit the purse of the customer, is reported to have its headquarters in this city.

Existence of the fake school has been brought to light by Dr. A. H. Reynolds, 4630 Chester avenue, secretary of the state board of dental examiners.

Through a negro, Casimiro Riveras, who obtained a worthless diploma from the so-called "Old Physio College," 1035 Walnut street, Dr. Reynolds learned of the fake dental college and obtained documentary evidence which will be submitted to the attorney general of Pennsylvania for further investigation and prosecution.

"The Old Physio College exists in name only," asserted Dr. Reynolds yesterday. "There may be a charter for such a school, but it never has got beyond that stage. The alleged college is and has been for a long period an unoccupied building and its president resides in New York City. It is nothing more than a fraudulent scheme to catch foolish men who believe that by obtaining a fake diploma they are able to practice dentistry."

ROBBERIES

Louisville, Ky., Dec. 11.—Louisville College of Dentistry; safe cracked; cash, gold and platinum, $1,825. Experts; no clue.

South Bend, Ind., Nov. 24.—Dr. Charles Feldman; gold, $50.

Rochester, Mich., Dec. 9.—Drs. O. J. Lasenby and L. W. Curtis; gold, teeth, platinum; $75. Second trip in year.

Rockford, Ill., Nov. 28.—Several offices; about $300.

Albion, Mich., Dec. 4.—Dr. W. Rice; gold, $35. Daylight.

Muscatine, Ia., Dec. 2.—Drs. A. Klaffenbach and W. R. Ogle; $50.

Springfield, Ill., Nov. 28.—J. F. Michaels, giving Omaha, Neb., as his address, was arrested here this afternoon, caught in the act of robbing the dental office of Dr. E. F. Hazell, who siezed Michaels and held him while he telephoned for the police.

Charlotte, Mich., Dec. 2.—Offices of Drs. Zederbaum, Lackey and Wright; gold, $125; daylight; second visit.

Indianapolis, Ind., Nov. 18.—Offices of Drs. Frederic R. Henshaw, Charles R. Jackson and G. W. Perlee, in Indiana Pythian Building; gold and instruments, $400.

LISTERINE

Listerine is a fragrant non-toxic antiseptic, composed of volatile and non-volatile constituents, agreeable to the taste, refreshing in its application and lasting in its antiseptic effects.

Listerine is truly prophylactic, in that it exercises an inhibitory action upon the acid-forming bacteria of the mouth, and thus maintains the alkaline condition so necessary for the welfare of the teeth.

An alkaline mouth-wash increases the virility of the acid-forming bacteria of the mouth, while the mineral acids arrest the processes upon which the production of the acid fermentation depend. Listerine is a saturated solution of the mild mineral antiseptic, boric acid, plus ozoniferous oils and essences.

The acid reaction of Listerine has no effect whatever upon the tooth structure, whilst its alterative properties not only add to the protective quality of the saliva, but are antagonistic to the bacteria of the mouth.

The prompt action of Listerine in cleansing and purifying the mucous surfaces, and its cooling, refreshing effect upon the tissues is very grateful to the patient.

"THE DENTIST'S PATIENT"

A leaflet designed to convey useful information respecting the care of the teeth.

Supplies of this interesting treatise on oral hygiene are furnished free of expense to dental practitioners for distribution among their patients. A specimen copy, together with an order-form, will be sent upon request.

LAMBERT PHARMACAL COMPANY

LOCUST AND TWENTY-FIRST STS. ST. LOUIS, MISSOURI

Be assured of genuine Listerine by purchasing an original package

DEATHS

At Crete, Ill., Nov. 11, Dr. John C. Hochan, aged 45.

At Morris Park, L. I., Nov. 12, Dr. Edwin King Gerow; cancer of intestines; aged 42.

At St. Louis, Mo., Nov. 14, Dr. Thomas E. Turner, president Missouri State Board and third vice-president of the National Association, was accidentally killed by his own automobile. The engine had "died" while en route; he descended without shifting the clutch and "cranked up." The machine, in high speed, lurched forward and crushed him to death under its wheels. He was 47 years old.

At Jasonville, Ind., Nov. 14, Dr. A. F. Wooten; suicide; financial trouble; aged 30.

At Logansport, Ind., November 25, Dr. J. E. Boyer, of chronic appendicitis; aged 38 years.

At Detroit, Mich., Nov. 26, Dr. Henry S. Edmonds; heart failure; aged 38.

At Philadelphia, Pa., Nov. 26., Dr. James Truman, a former dean of the dental department of the University of Pennsylvania, aged 88. He had been the editor of several publications devoted to dentistry.

At Des Moines, Ia., Nov. 13, Dr. A. R. Begun; heart failure; aged 66.

At Moylan, Pa., Dec. 9, Dr. Louis Jack, retired; aged 82. Dr. Jack graduated from the Philadelphia College of Dental Surgery in the class of 1854. In 1877 he moved to Middletown, Delaware county, where he raised Ayrshire and Guernsey cattle. In 1908 he built a palatial residence in Moylan, and has since lived there. He was one of the founders of the Philadelphia Dental Club. He was also a member of a number of dental organizations throughout the country and wrote for several dental publications.

At Chicago, Ill., Dec. 14, Dr. W. W. Walker; suicide; ill health; aged 50.

At Warren, Ohio, Dec. 4, Dr. J. F. McCamant; apoplexy; aged 58.

At St. Louis, Mo., Dec. 7, Dr. James P. Geekle; heart failure; aged 45.

At New York City, Nov. 3, Dr. J. Morgan Howe, aged 71. Dr. Howe was well known to dentists all over the United States and was the author of a number of works on dental treatment and kindred subjects.

New Teeth at 87

Potterville, Mich., Nov. 20.—Chester Stevens, of Potterville, who is more than 87, has cut six new front teeth during the last summer. He also reads ordinary newspaper print without his glasses.

Jeweled Teeth of Americans

Among the natives of parts of South America before the advent of the Spaniards, it was the custom of some of the beaux and belles to decorate their teeth by having gold and precious stones inserted in them.

Dr. Marshall H. Saville, professor of American archæology at Columbia University, in his explorations in Central and South America, discovered several skulls the teeth of which were so decorated. In the Mayan area he found teeth inlaid with jadeite. In Mexico he found teeth with hematite, turquoise, rock crystal and obsidian settings.

At Atacames. in the Province of Esmeraldas, Ecuador, he obtained an upper jaw containing two extraordinary teeth. The middle incisors of each bore a disc of gold that had been inserted in a cavity drilled in the enamel as perfectly as a modern dentist could have done it. But the right middle tooth is not a middle incisor at all, but a right lateral incisor that had been taken from some one else's mouth and implanted here to replace a missing front tooth. It fits perfectly in the socket, though it is not so long as that cavity, and Prof. Saville considers this to be proof that it was implanted in the jaw only a short time before death.

The most interesting of these specimens is a skull discovered at La Pedra, Ecuador, by Mr. Pinzon and George D. Hedian, American Consular Agent at Esmeraldas, and presented to Prof. Saville by them. It is that of a woman. The incisors and canine teeth are almost entirely covered on their outer face by an overlay of gold. A broad band of enamel has been filed off, leaving enamel only at the cutting edge and close to the gum. In some instances the sawing has been done slightly under the enamel, so that the gold might be held securely. The gold has gone from all the teeth except the left lateral incisor. In some of the others traces of cement may still be seen.

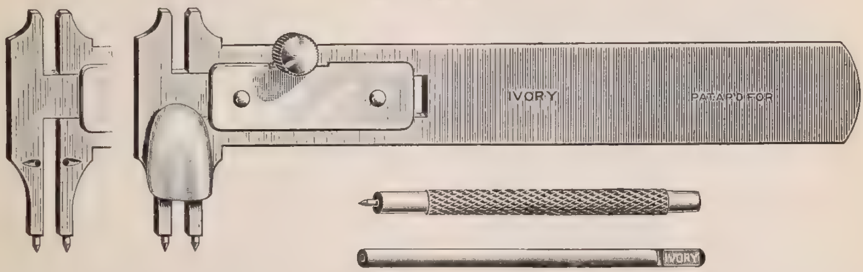
In describing these extraordinary teeth in an article in the *American Anthropologist*, Prof. Saville asks how the owners could have stood the pain of the slow cutting by stone drills with sand and water, for no metal tools with which the work could have been done have been discovered in Ecuador. He suggests that these natives had found out the property of coca in producing local anesthesia. The people of the coast were addicted to chewing coca leaves mixed with lime, and Prof. Saville thinks it reasonable to surmise that they may have used it to deaden the pain of the filing and sawing.

The gold and jewelled inlays are as skillfully done as those of a dentist of today; there is no sign of decay either behind or around them, which proves with what perfect accuracy they must have been made.

MASON'S

Spacing Caliper and Auxiliaries

Patent Applied For



THIS Spacing Caliper provides an easy method for adapting backings to facings so that it is impossible for the flux or the solder to come in contact with the porcelain, thus eliminating checking.

Operation

The pins of the facing are placed in the holes on the side of the Caliper which have guide slots to guide the pins into the holes; this accurately spaces the holes which register with pins of the tooth, held in that position by the thumb nut; the backing is then marked or pierced by the hardened points which give the exact spacing for the pins; now place the backing thus marked on a piece of lead; then with the pointed punch the metal or gold is pierced, throwing up a lip; giving an aperture the same size of the pin; the backing thus pierced is placed on the tooth, the lips extending on the pins, finally to burnish this lip of gold to the pins, the engine or lathe tool is used, which has an aperture in the end of the same, which fits over the pins, then with a high speed of the engine or lathe the gold is burnished around the pins, which after examination will show that the gold is spun up around the pins, as though attached to them; furthermore the biting or other edges of the teeth may have the backing burnished over them without displacing the metal from the pins; this is economical as that part of the pin extending instead of being bent over "as usually done" may be clipped off.

Price Complete - - - -	**$2.50**
Burnisher or Punch, separate each	**.25**

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Why Brown Bread, Not White, is the Real "Staff of Life"

One of the most difficult tasks that confronts the family physician is to induce his dyspeptic patients to break themselves of the white bread habit. Usually it is useless for him to tell them that the "staff of life" got its name long before the invention of machines that made white bread possible, and that to utilize as food only the white starch particles of wheat is to devitalize and "denature" the most valuable of nature's food materials.

Science shows that the grain of wheat contains, in organic form, all of the twelve mineral substances needed by the animal body. Chickens, guinea pigs or monkeys fed on whole wheat bread will thrive, but the same animals fed on an exclusive white bread diet will die. In order to obtain white bread, three-fourths of the minerals, including the phosphorous, iron, lime, chlorine, silica, sulphur, potassium and magnesium are discarded.

These elements—as explained by a writer in the Herald of Health magazine—are contained in the brown outer skin of the wheat berry, called the bran, and in the "shorts," "middlings" and "tailings," which are sifted and bolted out of the ground meal, leaving principally the white, starchy part of the interior part of the berry.

The millers admit that they do not give the people white flour or white bread through their own choice, but that because the people think they want white flour and white bread they are obliged to pander to them.

The millers, in their consternation at the thought of our eating the bran of the wheat, fail to warn us against eating corn on the cob. Every time we eat a "roasting ear" we eat the "bran" of the corn, and every time we eat beans or peas we eat the "bran" of the bean and the "bran "of the pea, and it is well that we eat these things, because while they are not digested in themselves, they surrender to the body the invaluable mineral salts which they contain. Accordingly, while it may appear to the dullard that they have no place in the diet of man, they contribute wonderfully to the life-giving properties of his food.

Just as chopped meat surrenders its mineral salts to the water in which it is immersed, through the processes of osmosis that we have described, so also does the bran of the wheat surrender its minerals to the body in the same way. But—the bran not only furnishes indispensable mineral salts to the body, but its chief virtue is as a regulator of the peristaltic action of the alimentary tract by which its contents are kept moving onward.

In Dr. Albert Westlake's new edition of his book on "Babies' Teeth to the Twelfth Year," he says:

"Babies' teeth should receive consideration at least six months before the child is born. Necessary elements in their building up are furnished at this period by the mother's blood, hence the need of the purity of the latter.

"Teeth require more organic phosphate (particularly phosphate of calcium and carbonates of lime) than other parts of the body; therefore, bone food is necessary for the mother (cow's milk, eggs, especially yolks, peas, beans, lentils, whole wheat, outer grains, etc.).

"Dietetic treatment for the mother is very important at this period while bone is forming.

"The intestines of the child are also undergoing vital changes at this period and earlier. This includes the primary fixation of the child's intestine in the left hypochondriac region.

"It is, therefore, vital to the offspring to get perfect peristalsis of the mother's intestines. Elimination should be regular without drugs."

For this reason alone the mother should not be robbed of the potassium, sodium, magnesium, iron, phosphorus, sulphur, silica and chlorine which genuine whole wheat bread affords.

Disappointing the Gloaters

"I wanter 'ave a tooth drawn," said the youngster with the pugnacious face, "and I want gas."

"Tut! Tut!" murmured the dentist. "You're not old enough for gas. And I see you're not afraid of a little pain. Be a man!"

"'Tisn't that," runs a British weekly's version of the story, "but I expect just at the end I'll give a little bit of a squeal."

"Oh, that won't matter," the dentist replied. "I shan't mind."

"No," retorted the boy, "but I shall. Just you look out of the window."

The dentist turned to look out and saw a group of grinning lads standing close by his window.

"Well," he asked his youthful patient. "What does that mean?"

"Those are all the kids I've fought and licked," explained the boy, "and they've all followed me here just to hear me holler. Gimme gas!"

Intensely Unenthusiastic

Mother—"I'm afraid Laura will never become a great pianist."

Father—"What makes you so discouraged?"

Mother—"This morning she seemed beside herself with joy when I told her she must omit her music lesson to go to the dentist."—*Woman's Journal.*

THE DENTAL SUMMARY
THE MAGAZINE THAT HELPS

Vol. XXXV FEBRUARY, 1915 No. 2

OFFICIAL ORGAN

The Ohio State Dental Society
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The Indiana State Dental Society
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REGULAR CONTRIBUTIONS

THE TECHNIC OF CONDUCTIVE ANESTHESIA

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THE MOST IMPORTANT REQUIREMENTS for a successful local anesthesia are, asepsis, pathology, anatomy and technic. While for infiltration anesthesia the necessary knowledge of anatomy and technic is easily acquired, the conductive method (nerve-blocking) compels us to devote considerably more time to the study of these two subjects. Seidel, Buente and Moral have written extensively on the anatomy of the maxilla and mandible. From my own experience I endorse Buente's statement, that "without a question the anatomical relations must be looked upon as the fundament of a successful conductive anesthesia." Therefore, in the following pages special attention will be given to the anatomy of the parts concerned. I have tried the various methods of injection as outlined by different authors, but will describe only those which, after a long trial and with slight modifications, I have found most simple, practical and successful.

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*Read before the Ohio State Dental Society, 1914

As to solution, syringe and needles enployed in this work, the reader is referred to my article on Local Anesthesia in the March, 1914, issue of the *Items of Interest*. I only would like to state that a two per cent. novocain (Farbwerke Hoechst Co.) solution, made either with tablets E, which contain novocain and suprarenin, or tablets D, to which one drop of adrenalin to each c.c. was added, has been used for experimental purposes in *all* cases, including patients from four and one-half to eighty-two years old, without ill effects. Steel needles are employed exclusively; in private practice they are discarded after each patient, while at the hospital one set of needles is used an entire week (three clinic days); but neither my assistants nor I have ever broken a needle. Tincture of iodine is used to disinfect the mucous membrane at the point of insertion of the needle.

For conductive anesthesia in the upper jaw, two nerve loops must be taken into consideration; the outer of which is formed by a part of the maxillary division of the fifth cranial nerve and its termination, the infraorbital, and their branches: the posterior, middle and anterior superior dental nerves. The posterior superior dental branches enter the bone through the posterior dental foramina (foramina alveolaria) at the tuberosity (tuber maxillæ); the middle superior springs from the infraorbital nerve in the posterior part of the infraorbital canal, and the anterior superior branches just posteriorly to the infraorbital foramen. The abovementioned nerve loop supplies the bone and all the teeth of the corresponding half jaw, the mucous membrane of the maxillary sinus and the buccal periosteum and gum tissue. The infraorbital nerve—after leaving the foramen—distributes branches to the lower eyelid, the side of the nose and the movable part of the septal cartilage (*alae nasi and septum mobile nasi*), and skin and mucous membrane of one-half of the upper lip. At the tuberosity are two to three posterior dental foramina at a distance of one to two cm., above the alveolar border. The infraorbital foramen is situated about seven mm. below the center of the lower orbital margin.

The inner nerve loop also originates from the maxillary division of the fifth cranial nerve, but through the medium of the spheno-palatine ganglion, which receives its motor (great superficial petrosal nerve of the seventh cranial n.) and sympathetic (great deep petrosal nerve of the carotid plexus) roots from the Vidian nerve; the great superficial petrosal and great deep petrosal nerves join to form the Vidian. The anterior palatine nerve (of the descending branches of this ganglion) making its appearance upon the palate through the anterior palatine foramen and the nasopalatine (of the internal branches) coming through the incisive foramen are the two components of the inner nerve loop (Fig. 1). It supplies the hard palate of one side and the soft tissues covering it. The anterior palatine foramen will be found one-half cm. to the palatal side of the alveolar border of the first, second or third molar, depending upon the age of the patient. The incisive foramen occupies a position eight mm. behind the alveolar process between the two central incisors in the median line. This opening is very easily reached, because it lies behind and above the incisive papilla.

To anesthetize the nerves at the tuberosity, we hold the lip and cheek away with the index finger of the left hand and tell the patient to partly close his mouth; then we take the syringe with the right hand, pierce the mucous membrane at a point corresponding to the middle of the disto-buccal root of the second molar and—continuously injecting while the needle is in the tissues—proceed in the direction above the apex of the third molar until about two cm. of the needle disappear; stay in contact with the bone and deposit one to two c.c. of the solution. In children, and in cases where the third molar has not erupted, always use the last molar and the one next to the last as guides.

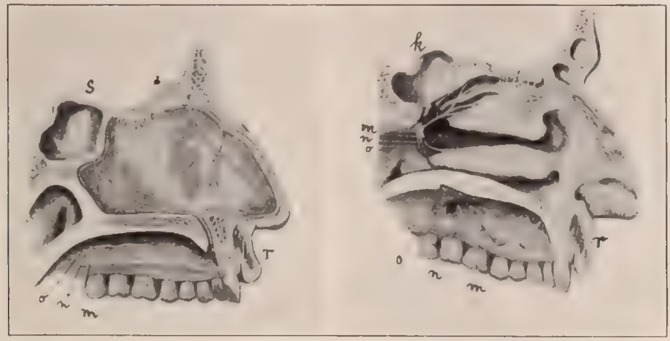

Fig. 1

Fig. 1 (Cunningham)—K, spheno-palatine ganglion; m, anterior palatine nerve; n, middle palatine nerve; o, posterior palatine nerve; r, left naso-palatine nerve; s, right naso-palatine nerve.

In about ten minutes the second and third molars will be anesthetized for operative dental work, the first molar in most cases, and remain so for an hour. But the bone and soft tissues on the palatal side are supplied by the anterior palatine nerve, which must therefore be blocked to insure an absolutely painless operation in this region.

The technic of blocking the anterior palatine nerve at its foramen is as follows: From a point one cm. to the palatal side of the alveolar border of the second molar, direct the needle toward the anterior palatine foramen, which lies about one-half cm. mesially from the alveolar border of the third molar and inject three to five drops. In a few moments the whole palatal side up to and very often including the region of the canine tooth is anesthetized.

Infraorbital anesthesia includes the blocking of the infraorbital nerve at the foramen and the anterior superior dental branches. To effect this, place the index finger of the left hand about one cm. below the middle of the lower orbital margin—the position of the infraorbital foramen—and with it and the thumb of the same hand, pull the upper lip forward and upward. We now pierce the mucous membrane at a point near its fold but in the lip tissue, distally to the apex of the cuspid tooth and aim quickly at the foramen, where we inject one to two c.c. Massage with the thumb over the foramen will force the solution into the infraorbital canal and infiltrate the anterior superior dental nerve. Very shortly (five to ten minutes) all the teeth, the buccal mucous membrane and the bone, from the cuspid tooth to the central incisor, are anesthetized. In working near the median line it is well to inject locally just beyond this line to eliminate the anastomosis of the other side. The duration is about an hour. The palate behind the incisor teeth is innervated by the naso-palatine nerves, which must be blocked separately (incisive anesthesia).

In giving an incisive anesthesia look for the incisive papilla, pierce its posterior aspect, direct the needle upward and backward and a little distance through the foramen. Inject as soon as you enter the tissues and slowly deposit three to five drops while proceeding as outlined, to give the patient as little pain as possible. This will anesthetize the hard palate in the region of the four incisors and posteriorly a little beyond the foramen; the part remains anesthetized for about an hour.

While the nerve supply of the maxilla, as given above, may be considered normal, it must nevertheless be of great interest to the practitioner to review the different descriptions by the most prominent anatomists and also the more common variations in the distribution of these nerves; thus we should find an explanation of the variation in the extent of the area anesthetized by the same method in different patients or the failure to produce anesthesia.

Piersol, in his anatomy, states "that in absence of the buccal branch of the fifth, the posterior superior dental has been observed to be of large size and to assume the distribution of the buccal.

"The middle superior dental nerve occasionally arises from the anterior superior dental.

"The anterior superior dental nerve is the largest of the three superior dental nerves." They all help to form the superior dental plexus.

"Two thickenings are sometimes found in the superior dental plexus. One of these, known as the ganglion of Valentin, lies above the tip of the root of the second premolar tooth, at the junction of the middle and posterior superior dental nerves; and the other, sometimes called the ganglion of Bochdalek, is situated more anteriorly, at the junction of the middle and anterior dental nerves. Neither of these enlargements is a true ganglion, being without nerve-cells and consisting of interlacing bundles of nerve-fibers."

Gray gives the following description: "The posterior superior dental branches enter the posterior dental canals on the zygomatic surface of the maxilla, and passing from behind foward in the substance of the bone, communicate with the middle dental nerve by a plexus formation, and give off branches to the lining membrane of the antrum and three twigs to each molar tooth. These twigs enter the foramina at the apices of the fangs and supply the pulp."

"The middle superior dental branch is given off from the superior maxillary nerve in the back part of the infraorbital canal, and runs downward and forward in a special canal in the outer wall of the antrum to supply the two bicuspid teeth. It communicates with the posterior and anterior dental branches by a plexus formation (*plexus dentalis superior*)."

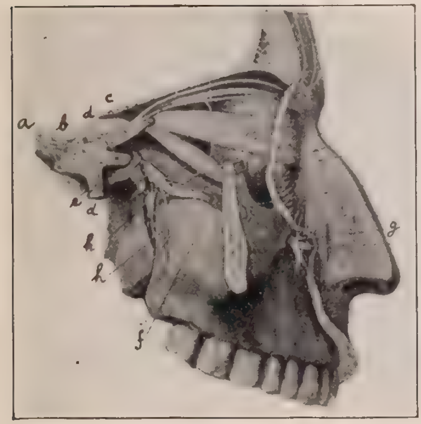

Fig. 2

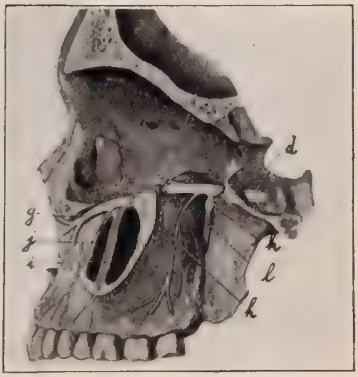

Fig. 3

Fig. 2 (Cunningham)—a, trigeminal nerve; b, semilunar ganglion; c, opthalmic nerve; d, maxillary nerve; e, mandibular nerve; f, infraorbital nerve, entering canal; g, infraorbital nerve, leaving canal; h, posterior superior alveolar nerve; k, sphenopalatine ganglion.

Fig. 3 (Cunningham)—d, maxillary nerve at foramen rotundum; g, infra-orbital nerve appearing on the face at the infra-orbital foramen; i, middle and j, anterior alveolar branches; h, posterior superior alveolar nerve; k, spheno-palatine ganglion and nerves; l, palatine branches.

In Cunningham's text-book of anatomy the superior dental nerves are somewhat differently distributed: "*Rami alveolares superiores posteriores* (posterior superior alveolar nerves, which may be double) descend through the pterygo maxillary fissure to the lateral side of the maxilla, and proceed forward along the alveolar arch, in company with the posterior alveolar artery. They supply the gum and the upper molar teeth by branches which perforate the bone to reach the alveoli. The nerves form a fine plexus joined by the middle alveolar nerve before finally reaching the teeth." (Fig. 2.)

"In the infraorbital canal the infraorbital nerve supplies *one* and *sometimes* two branches to the teeth—the middle and anterior superior alveolar nerves (*ramus alveolaris superior medius et rami alveolares superiores anteriores*). The former may be only a secondary branch of the latter nerves, or they may arise independently from the infraorbital nerve. However formed, the nerves descend in bony canals in the wall of the maxillary sinus (to the lining of which branches are given), and reach the alveolar arch, when they form minute plexuses and supply the teeth (joining posteriorly with the branches of the posterior superior alveolar nerve). The anterior superior alveolar nerve supplies the incisor and canine teeth; the middle superior alveolar nerve the premolar teeth." (Fig. 3.)

Spalteholz describes the ramus alveolaris superior medius as being given off in the posterior part of the infraorbital canal, while the corresponding illustration shows it to branch off before the maxillary nerve enters the canal. (Fig. 4.)

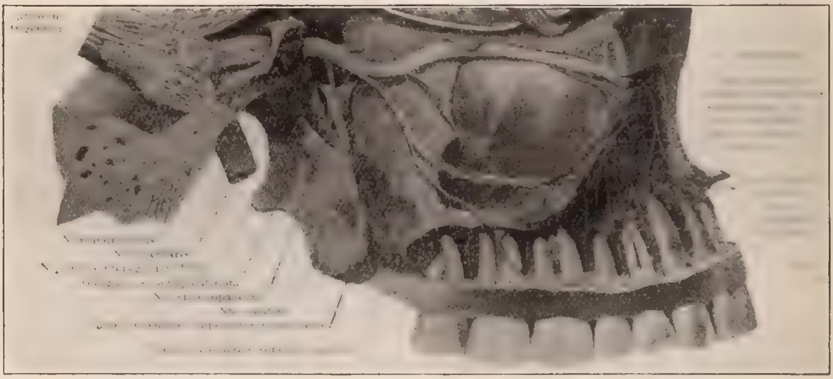

Fig. 4. (Spalteholz)

According to Zuckerkandl, only the posterior and anterior superior dental nerves are constantly present, the former supplying the molar teeth. The middle branch—if present—innervates the bicuspid teeth.

Fischer, in his book on local anesthesia, illustrates in two diagrams the areas of nerve supply of the maxilla on the buccal and palatal side. The buccal area of the bicuspids is called a mixed region, because it is not only supplied by the middle, but also by the anterior and posterior branches. The diagram (Fig. 5) representing the areas of the palate, in which a line connecting the posterior surfaces of the second bicuspids separates the region supplied by the anterior palatine and naso-palatine nerves respectively, does not correspond to anatomical findings nor clinical observation. (Fig. 6.)

Braun describes the posterior and middle superior dental branches as running externally over the tuber maxillæ and entering the bone above the third molar, behind the attachment of the zygomatic process.

In studying carefully the different descriptions of the nerve supply of the maxilla, we must necessarily come to the conclusion that the teeth are not innervated by the posterior, middle and anterior superior dental branches directly, but through the medium of the superior dental plexus. The middle branch—according to Zuckerkandl and Cunningham—is only present in a certain percentage of cases; it often is a part of the anterior, which is always the largest nerve of the three.

The ganglion of Valentin, situated above the tip of the root of the second premolar tooth, gives evidence of an anastomosis between posterior and middle nerves and accounts for the number of failures to anesthetize the first molar region by a tuberosity injection. With an infraorbital anesthesia we very often reach the first bicuspid, but I never could include the second (ganglion of Bochdalek). In some instances a tuberosity and infraorbital injection will still leave the region of the bicuspid sensitive, which can only be explained—assuming the injection has been properly given—by a large middle branch given off in the infraorbital canal. Both bicuspids will, under normal conditions, never be anesthetized with a tuberosity injection, unless large quantities of the solution are deposited and driven up and around the maxillary nerve before it enters the infraorbital canal, which would be equal to a blocking of the second division. Even if the posterior and middle branches enter the bone at the tuberosity and we there anesthetize both, the first bicuspid will remain sensitive on account

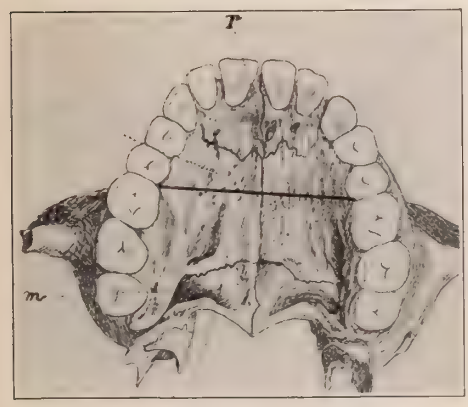

Fig. 5

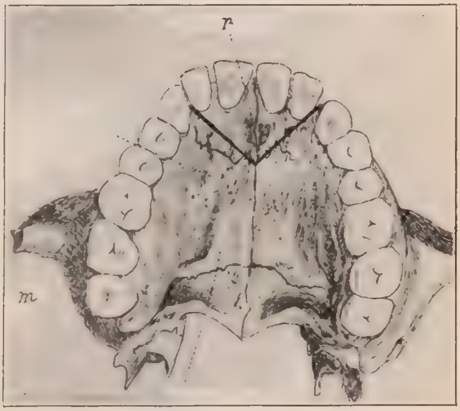

Fig. 6

Fig. 5 (Fischer)—r, n. naso-palatinus; m, n. palat. major (anterior).

Fig. 6—r, n. naso-palatinus; m, n. palat. major (anterior). Line dividing areas supplied by r and m, according to clinical observation.

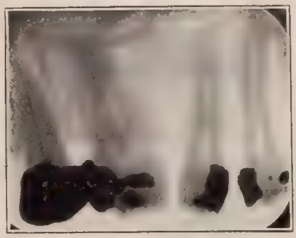

Fig. 7

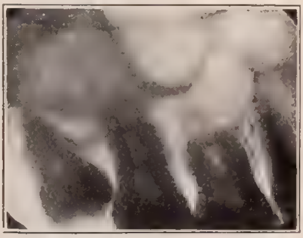

Fig. 8

Fig. 7—Chronic apical pericementitis of upper wisdom tooth. Extraction under tub. (1 c.c.) and ant. pal. (o. 3 c.c.) anesthesia.

Fig. 8—Partly impacted upper wisdom tooth. Extraction under tub. (1 c.c.) and ant. pal. (o. 5 c.c.) anesthesia.

of the anastomosis of the anterior and middle nerves. Local injection (infiltration) must be recommended for operative work on the bicuspid teeth with the exception of infected cases.

The injection at the anterior palatine foramen in most cases includes the cuspid region. Deposit only a few drops and not too far back; otherwise the middle and posterior palatine branches supplying the soft palate and tonsils will also be anesthetized causing the sensation of a swollen throat and a peculiar feeling on swallowing, both alarming to the patient.

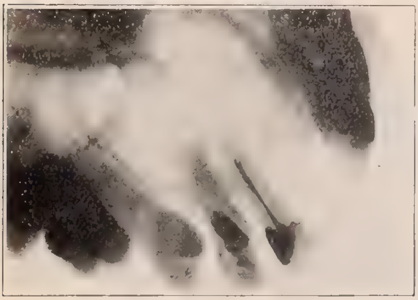

Fig. 9

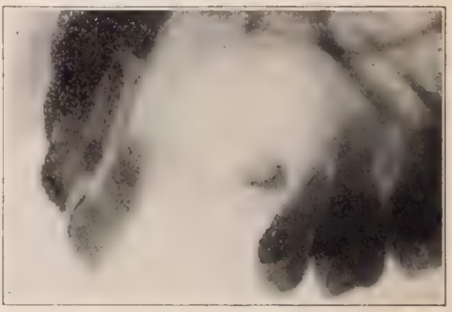

Fig. 10

Fig. 9—Radicular cyst in region of incisors, cuspid and first bicuspid. Partsch's operation No. 2 under infraorbital (2 c.c.) not satisfactory therefore another infraorbital (1 c.c.) was given; also incisive (o. 5 c.c.), anterior palatine (o. 5 c.c.), local (1 c.c.) in median line (labial) and over second bicuspid. (1 c. c.).

Fig. 10—Radicular cyst in region of lateral incisor, cuspid and two bicuspids. Partsch's operation No. 2 performed under infraorbital (2 c.c.), local (o. 5 c. c.) in median line, ant. pal. (o. 3 c.c.) and incisive (o. 2 c.c.).

The area of the incisive nerve forms a triangle on the palatal side behind the incisor teeth corresponding to the intermaxillary bone.

Let us now study those parts of the anatomy of the mandible, which are of great importance in the technic of mandibular and mental anesthesia. By placing the index finger upon the buccal fold of the mucous membrane and gently forcing the cheek away we detect with the finger ball a prominent ridge—the external oblique line—extending from the outer surface of the mandible in the molar region backward and upward to the coronoid process, to which the temporal muscle is attached. Rest the ball of the same finger on that part of the line, which lies just postero-externally to the last molar, turn the finger-point inward and then downward, and the finger-ball will fall into a depression—the retromolar triangle—while the finger nail touches the ill-defined internal oblique line. This line is situated mesio-posteriorly to the external, and both form—with the last molar as the base—the above-mentioned triangular space (Fig. 12). On the inner aspect of the ascending ramus we find the mandibular foramen at about the level of the occlusal surfaces of the molar teeth. Posterior to the foramen is a depression—the mandibular sulcus—of approximately two cm. in diameter. It forms the external boundary of the pterygo-mandibular space, the internal pterygoid muscle being on the inner side. This space is made up of connective tissue and through it pass the internal maxillary artery, the inferior dental nerve and vessels and the lingual nerve. The inferior dental nerve lies anterior and mesial to the vessels, the lingual nerve in the front part of the space.

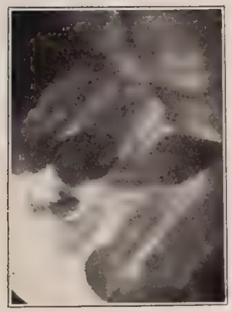

Fig. 11

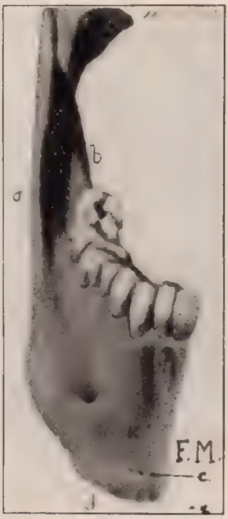

Fig. 12

Fig.11—Unerupted cuspid in inverted position. Removal of cuspid also of temporary cuspid and first molar under infra-orbital (1.5 c.c.) and local (o. 5 c.c.) on palatal side in cuspid region.

Fig. 12 (Buente & Moral) a, external oblique line; b, internal oblique line.

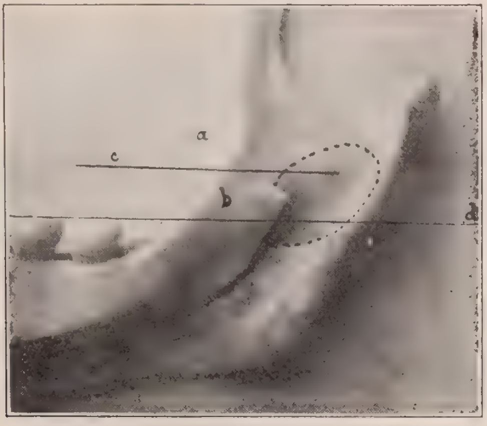

Fig. 13

Fig. 13 (Seidel)— a, external oblique line; b, internal oblique line; c, position of the needle; d, occlusal plane; the punctuated line forms the boundary of the mandibular sulcus

The upper half of this space represents the most favorable position for blocking the inferior dental nerve. (Figs. 13 and 14.)

This nerve supplies all the teeth of the lower jaw, the bone, periosteum and mucous membrane, except the lingual mucous membrane and periosteum, which is innervated by the lingual nerve.

In the region below the second or below and between the first and second bicuspids, and in the middle of the external surface, lies the mental foramen; through it passes the mental nerve, branch of the inferior dental, to the skin of the chin, also the skin and mucous membrane of the lower lip. At the middle line the inferior dental, mental and lingual nerves of both sides anastomose. In a small percentage of cases the long buccal

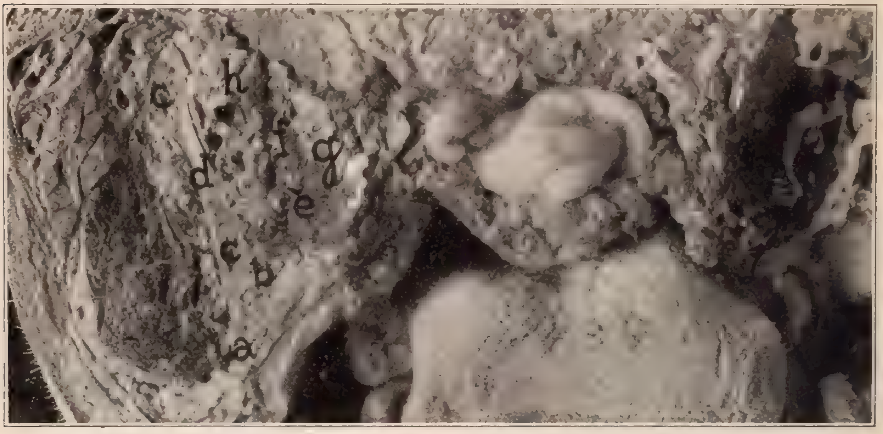

Fig. 14

Fig. 14—Horizontal section through ascending ramus of mandible in plane on mandibular injection; a, external oblique line; b, internal oblique line; c, ascending ramus of mandible; d, sulcus madibularis, between it and the internal pterygoid muscle; g, is the spatium pterygo-mandibulare; e, is the lingual; f, the inferior dental nerve; h, internal maxillary artery.

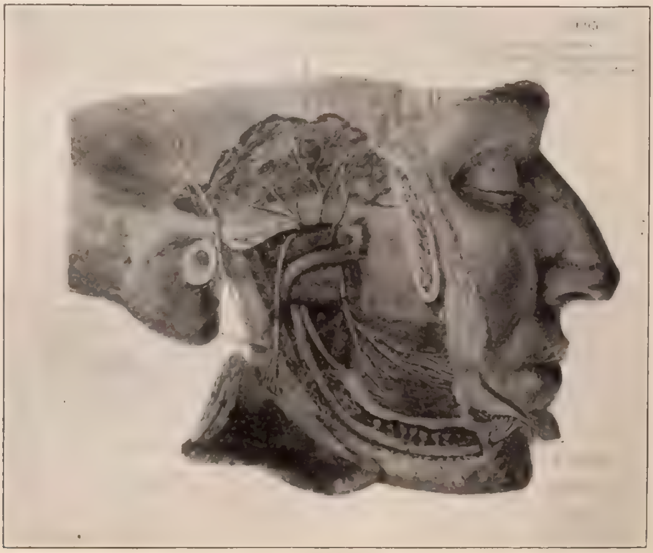

Fig. 15 (Spalteholz)

nerve (*nervus buccinatorius*) supplies the buccal mucous membrane of the bicuspid and molar region. (Figs. 15 and 16.)

Several different methods of mandibular anesthesia have been described, which can be divided into external and internal. The external is practically only recommended in cases where technical difficulties or infections exclude the other.

Peckert reaches the mandibular foramen with a curved needle puncturing the skin at the angle of lower jaw.

Gadd inserts a straight needle on the mesial side of the mandible at the middle, between the angle of the mandible and that point of the lower border where the *a. maxillaris externa* passes it.

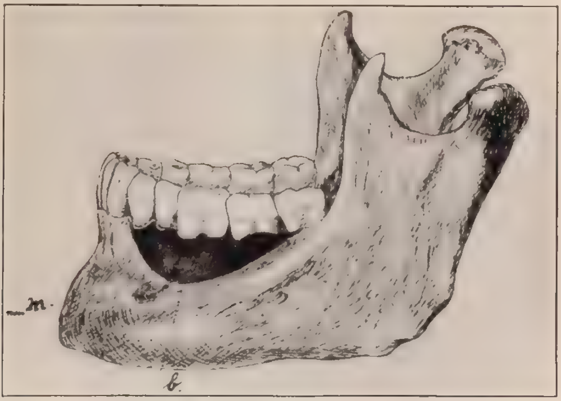

Fig. 16

Fig. 16 (Fischer)—b, area supplied by n. buccinatorius; m, mental foramen.

Zorn mounts the needle at right angles with the syringe in giving mandibular anesthesia intraorally.

Tuerkheim injects by the same route with a curved needle while the teeth are in occlusion.

Braun's method only—more or less modified—is practiced at the present day.

Personally, I prefer a modification of Seidel's technic, palpating with the index finger only, holding the syringe with the right or left hand respectively and turning the bevel of the heavy steel needle towards the nerves and away from the bone.

Let us say, for example, that we wish to give a mandibular injection on the right side. Have the patient open his mouth; with the index finger of the left hand find the external oblique line. Now place the ball of the same finger over the retromolar triangle in such a manner that the finger nail touches the internal oblique line; retract this finger slightly and paint the region with iodine; grasp the syringe with your right hand, like a pen, and aim the needle one cm. above the occlusal plane of the lower jaw through the soft tissues directly at the internal oblique line; retract the needle somewhat, so as to release it from the periosteum, and move it mesially until you find no more resistance to proceed backward, i.e., when you arrive at the mesial aspect of the ascending ramus, and inject about five drops of the solution to anesthetize the lingual nerve; get the point of the needle in contact with the mesial aspect of the ascending ramus by turning the syringe to the opposite side and remain so while going backward a little over two cm. (all told). The point of the needle is now in the upper half of the mandibular sulcus, where we inject the remainder of the solution. To anesthetize the left side, use the right hand as a guide and hold the syringe with the left; a little practice will overcome the difficulty of working with the left hand.

In a few minutes, upon questioning, the patient will tell you that his lip and tongue feel numb (swollen, hot, cold, empty, like electricity, without feeling). In almost every case the molars, bicuspids and the cuspids are completely anesthetized in from ten to twenty minutes. Before starting to operate test the mucous membrane by compressing it with a pair of pliers on the buccal side of the cuspid and of the tooth you wish to work upon and lingually. If, after twenty minutes, pain is felt in the cuspid region, a second mandibular injection must be given; in case the buccal mucous membrane in the molar and bicuspid region only is sensitive (i.e.: if supplied by the long buccal nerve), this part must be desensitized with a horizontal injection in the apical region of these teeth. In infected cases conductive anesthesia of the long buccal nerve may be resorted to, injecting the mucous membrane of the cheek below Steno's duct (Williger).

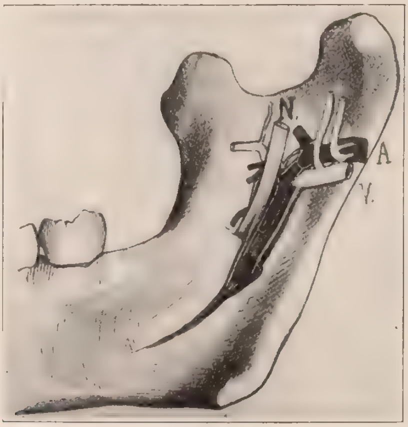

Fig. 17

Fig. 17 (Zuckerkandl)—relation of nerve and vessels in the pterygo-mandibulare space.

The anastomoses of the inferior dental, lingual and mental nerves explain why the middle portion of the lower jaw with the incisor teeth are not anesthetized. To obtain complete anesthesia of half of the lower jaw, the mental foramen of the opposite side must be injected. I have found mandibular anesthesia to last over two hours.

Mental anesthesia is indicated for operation on the bicuspids, cuspids and lateral incisors, and, in case of mandibular injection, to exclude the anastomosis of the opposite side.

Palpate for the mental foramen. Pierce the mucous membrane of the lip near its fold and below the second bicuspid, proceed downward and slightly forward (considering the fact that the foramen opens distally) to the middle, between the lower and alveolar border, to reach the foramen; inject one to two c.c. at the opening. The tissues will remain anesthetized for about an hour.

For operative dental work it is not necessary to inject for the lingual nerve in the pterygo-mandibular space or locally in the region of the teeth, because the inferior dental nerve only supplies the same.

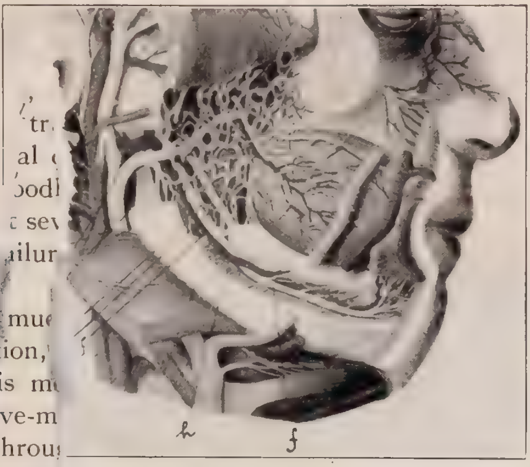

Fig. 18

Fig. 18 (Sob[illegible] lingual; f, inferior dental nerve; h, inferior dental artery.

The relati[illegible] e vessels and nerves in the pterygo-mandibular space is very impor[illegible]

Piersol, C[illegible] l Spalteholz do not describe the relative position of the inferior de[illegible] tery.

Cunningha[illegible] ys: "The inferior alveolar (artery) is a branch of moderate size [illegible] passes downwards, between the spheno-mandibular ligament and t[illegible] andible, to the mandibular foramen. It is accompanied by the i[illegible] r alveolar nerve, which lies in front of it."

In his Man[illegible] f Practical Anatomy, he points out that "the inferior dental artery ru[illegible] ownward behind it (the inferior dental nerve), whilst the lingual nerv[illegible] n front of it and upon a somewhat deeper plane."

Zuckerkand[illegible] ig. 17), Sobotta (Fig. 18), and Fischer give the same relation. In all [illegible] horizontal sections I have prepared, in the plane in which mandibul[illegible] nesthesia is given, this vessel lies always posterior and external to the nerves.

Contrary to the opinion of prominent anatomists, Loos describes the inferior alveolar nerve more posterior and mesial to the inferior alveolar artery, and Thoma in describing the pterygo-mandibular space, states:

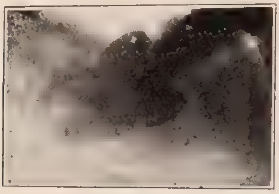

Fig. 19

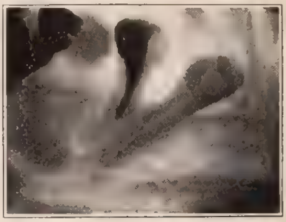

Fig. 20

Fig. 19—Impacted lower wisdom tooth removed under mandibular anesthesia (2 c.c.) and injection for long buccal nerve (1 c.c.).

Fig. 20—Unerupted and impacted cuspid. Removed under mental anesthesia (1.5 c. c.).

"The artery lies anteriorly to the nerve and is protected y the lingula, the nerve is more to the median line and posteriorly to the ery."

As far as the long buccal nerve is concerned, P ol mentions the following variation: "It may be derived from the ir or dental nerve emerging from the inferior dental canal by a small fora ı in the alveolar border of the mandible, just anterior to the ramus."

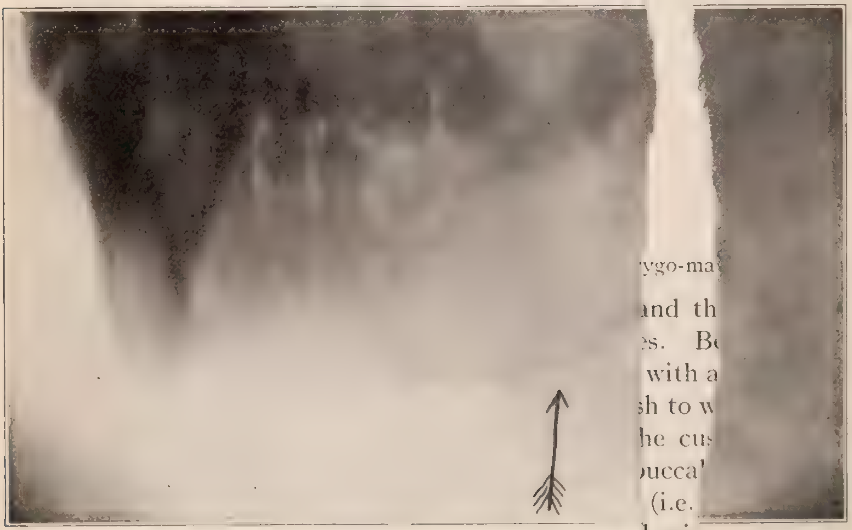

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Fig. 21

Fig. 21. Radicular cyst originating from two roots of first mo ject volving the region below the three molars. Partsch's operation No. 2 performed ı r mandibular anesthesia (2 c.c.). Patient, girl 13 years of age.

While Fischer, in the last edition of his book on ocal Anesthesia, states that a separate injection of this nerve does not seem to be required in his experience, I still have to resort to it in a small percentage of cases.

Trismus and pain on swallowing after mandibular anesthesia are caused mainly by infiltration of the internal pterygoid muscle with the solution. Responsible for it is the mistake the beginner makes to insert the needle too far mesially. It is especially prone to happen to the beginner, who employs Fischer's method, in which the point of insertion of the needle is nearer to the median line than in Seidel's or Braun's technic. Braun says: "The point of injection lies in the middle of the trigonum retromolare."

Conductive anesthesia should be employed by every dentist. The advantages over the infiltration method are: (1) Its long duration; (2) with one or two injections and less of the anesthetic large areas are anesthetized; (3) the infiltration of infected areas can be avoided; (4) the procedure is even less painful (if painful at all), because the solution is injected without pressure and into loose tissue. During a painless operation our mind can be concentrated almost entirely upon it, which means a better and quicker result, besides the advantage to the patient and his gratefulness. This holds true for operative dental work; considering minor and major oral surgical operations we must add, amongst other points: the comparatively bloodless field of operation and the elimination to a large extent of the first severe postoperative pain.

Occasional failures occur; I personally always attribute them to faulty technic.

We hear so much of late about broken needles, trismus, necrosis and pain after injection, etc. The average dentist needs practical instruction before using this method on private patients. But most important in causing the above-mentioned pathological conditions is the fact that since Fischer's tour through the states, so many are employing this method without seriously studying it and—more deplorable and to be condemned—a great many men are teaching this subject without having had adequate instruction themselves and after having practiced conductive anesthesia for only a very short time.

DISCUSSION

Dr. Hugh W. MacMillan, Cincinnati: The *essential principle* of conductive anesthesia is to deposit the anesthetizing solution in the closest proximity of the nerve supplying the part to be operated upon. This necessarily makes the *anatomy* of prime importance, leaving asepsis and pathology merely as factors to increase the efficiency in the technic of the injection. To be of use to the average dentist the anatomy and technic must be so *standardized* that the method may be employed in the easiest, quickest and best ways to gain the desired results.

The essayist has given us a beautiful description of the nerve supply of the maxilla, which should be thoroughly appreciated before attempting this work. Granting that the operator is in possession of this knowledge it is of first importance to know where he can best reach the nerve supply of each individual tooth, as conductive anesthesia, to be of any value to the dentist, must deal with operative procedures upon the teeth such as excavating sensitive dentine, removal of pulps and tooth extractions.

The pulp of a tooth is supplied by a small filament from the large nerve trunk supplying the parts. Just before the filament enters the apical foramen it gives off lateral branches which supply the alveolar process and gum tissue adjacent to the tooth. It follows then that the best possible method to anesthetize the tooth to be operated upon would be to inject the anesthetizing solution into the apical space or as close to it as possible. Hence, a study of the structure of the alveolar process over the apices of the individual teeth is necessary for rational procedures.

In the maxilla the buccal plate of the alveolar process over all the teeth except the second and third molars is very thin, the apices of the teeth projecting at times through the bone and even occasionally through the mucous membrane. The pulp of the tooth, the process and gum tissue is thus very easily anesthetized by reflecting the lip and injecting the solution through the labio-gingival fold along the bone *over* the *apical space.* The bone or even the periosteum should *not* be pierced by the needle. With the additional injection of a few drops on the lingual to control the palatal nerves such perfect results may be obtained by this method that I have abandoned the infraorbital injection except for harelip operations or extensive necrosis. For operative procedures on the molars the solution must be placed at the posterior dental foramina but for the extraction of these teeth a buccal and lingual injection will suffice. If the *process* is thoroughly anesthetized the extraction of a tooth may be done painlessly as a nerve trunk itself is almost devoid of sensation.

In the *mandible* the buccal plate is so thick that this method can not be pursued. The first bicuspids and the teeth anterior to them can easily be rendered insensible by an injection at the mental foramen. For the second bicuspid and molars the mandibular nerve must be injected.

The technic employed by the essayist is best suited to reaching this nerve. To be *successful* it is advisable to have the patient open his mouth as *far as possible*, as this brings at least a centimeter of the nerve more accessible. It is always better to insert the needle about 1.5 cm. above the line of the teeth. By employing this method the lingua is avoided and there is no danger of penetrating the internal pterygoid muscle.

There is a groundless fear among men unacquainted with the anatomy of the parts that there is danger of injecting into the inferior alveolar artery. By dissection of these parts I have proven to myself that it is impossible to injure the artery in any way and furthermore that the mandibular nerve is nearly five millimeters distant from the artery at the point at which I advise injection. The inferior alveolar branch is given off the internal maxillary artery on the *medial surface of the neck of the condyle* and passes down in a *sulcus* on the *inner surface* of the *ramus* to the *mandibular foramen.* It is so protected that it is almost inaccessible to the needle. On the other hand, the *nerve* passes through the foramen ovale which is approximately 25 mm. from the condyle and passes downward, forward and outward to a point below the lingula where it joins the artery. A line drawn from the condyle to the foramen ovale and from these points to the mandibular foramen forms an equilateral triangle, the sides of which are occupied by the nerve and artery respectively. It is thus seen that there is no danger of injuring the artery and this is further obviated when the jaws are wide apart.

The anatomy of these parts will also help us in our injection. We have all noticed that when the liquid is expelled from the needle it is forced out at an angle from the beveled side. By introducing the needle with the beveled side towards the bone there is less danger of injuring the periosteum. When the needle is in *position* for *injection*, the syringe should be given a half turn, bringing the bevel towards the nerve, and then the fluid will pass directly towards and around the nerve trunk. I have further applied this principle by closing up the point of the needle and drilling a hole in the side. The advantage of this needle is that it is easily kept sharp and directs the fluid at right angles.

Post-operative pains may come from a variety of causes, but proper technic will obviate all complications beyond a slight soreness such as is present when a needle is inserted into the arm. It is my belief that more complications are caused by *too heavy* needles than by any other cause. The needle used should not be over 23 gauge. These injections should be done painlessly. The practice of one person holding the head and another the hands of the patient while the operator plunges a heavy needle into the parts should be condemned from the standpoint of cruelty alone. By careful technic I have frequently anesthetized the mandibular nerve and after the injection have had the patient ask me when I was going to "run that needle in."

In my experience with conductive anesthesia I have never yet had to treat a patient for after-pains.

The practice of men teaching conductive anesthesia who are not qualified to give this instruction, is to be severely condemned. One should first have a thorough knowledge of the anatomy of the parts involved and of the anomalies that may be present; a thorough foundation in the principles of surgical cleanliness; a knowledge of the drugs he is using, and a broad experience with different methods. Conductive anesthesia is the greatest blessing that has come to dentistry in years and finds daily applications in the offices of men who are awake to rational methods.

Dr. J. P. Henahan, Cleveland: The members of this society are indeed to be congratulated upon their good fortune in having heard the paper presented by Dr. Blum.

He has shown that he is especially well informed upon the subject of conductive anesthesia, particularly in its relation to dental practice.

It would be hard for me to take exceptions to any of the statements made in the paper; on the contrary, I can only offer endorsement.

The very first statement in the article, that which draws attention to the importance of asepsis, is of the greatest moment. To my mind all other detail of technic should be considered subordinate to that which produces and maintains a condition of asepsis. To neglect this initial detail or to even slight it, is to court danger as in this direction lies practically all of the really serious effects which may follow the employment of this form of anesthesia.

Regarding the needles used in this procedure, I am inclined to agree with the doctor that steel needles are superior. In my own work I have employed platinum-iridium needles more than the steel variety, and I am not in position to endorse all the claims made for them.

In the first place they are very likely to bend when subjected to the strain required for injecting under difficult conditions, and the repeated heating only tends to make them softer. I have had the needles bend and break (but fortunately not in the tissues). Their cost is great compared with the steel variety, and this alone would be an argument in favor of the latter as it would be more economical to use a needle in one case and discard it.

In this form of anesthesia the dental profession is presented with another method for making operative procedures painless, and of saving the patient shock, together with all the other virtues and blessings attending a painless dental operation, wherein the dentist shares with the patient.

It is unnecessary to state, the claim is not made that this will prove the anesthetic of choice in every case; on the contrary there will present many conditions and we shall find many reasons why we should not resort to its employment in individual cases, and reasons also will present why we should employ one of the other excellent and tried anesthetic agents with which the profession is already familiar.

It is claimed, however, that the really progressive dentist should avail himself of any opportunity to gain proficiency in this method as undoubtedly he will find many occasions when it will be the only solution of the anesthetic problem.

In those cases where difficulty is always encountered in the production of and maintenance of a satisfactory general anesthetic, this form will prove eminently satisfactory.

The anesthetic may be employed in conjunction with general anesthesia, or preceding it, if for psychic or other reasons we should desire general anesthesia, for part of the operation.

My own experience has produced some interesting cases. I suppose the first case was really the most interesting from a personal standpoint, as it completely settled my confidence in the method.

Dr. Gregg gave a private clinic for a few dentists in my office during the past summer, and among the patients who presented was a young lady about 22 years of age, who required the removal of both inferior third molars, which were only partly erupted and causing great pain.

The injection was made by Dr. Gregg, and in about twenty minutes I removed the teeth. I could hardly believe that the patient really was not experiencing at least some pain, but such was the case. I carefully watched the patient afterwards and the recovery was complete and uneventful.

I have employed this method in fracture cases with varying results.

In one case a man suffering from a fracture of the superior maxillary, loss of several teeth and badly split lip. Case about four days' standing, the mouth in very bad condition, due to an entire neglect of cleansing and so sore that the slightest touch caused great pain.

Conductive anesthesia was employed and the technic as recommended by Dr. Gregg, and practically the same as that recommended in today's paper, followed; the result was only partly satisfactory, but permitted of about one and a half hour's work, during which time I made six bands and took a plaster impression and wax bite.

The next day I repeated the procedure and in addition infiltration anesthesia, along the margin of wounds in the bicuspid region, the anesthesia this time was complete, even in the wounded lip, and permitted of the setting of a soldered splint. The patient this time was loud in his praise of the result. He presented again in a week, at which time the improvement was so marked as to warrant the discharge of the patient. He still is under observation by an out-of-town dentist.

The second case was a bilateral fracture of the mandible and required injection of both sides at mandibular foramen, also in the region of the mental foramen. In this case the anesthesia was uneven, appearing to be complete in some areas and incomplete in others. However, it was possible to proceed with the making of bands, application of wires, etc. No soreness followed, although the procedure was repeated the following day and 8 c.c. injected. I have seen the patient since and he states that no soreness at all resulted, which might be attributed to the anesthesia.

There was a case which I saw injected, that of a girl 10 years of age, the day following injection the region which would have been anesthetized and the outside of face took on a greenish hue, which had not entirely disappeared in ten days. No soreness was complained of and no sloughing resulted.

The solution of Novocain is comparatively harmless, a large amount of a sterile 2% solution may be injected without harmful effect. It is far less toxic than cocain and the fact that it may be boiled without changing its form is greatly in its favor. This, of course, is said only of the properly preserved tablet; care should be exercised not to use tablets which are not perfectly white—yellow tablets indicate deterioration.

Inasfar as my own experience goes and my observation of the work of others, I can recommend this method of anesthesia to my brother dentists as one safe and reasonably certain when properly administered.

I must again compliment the essayist upon the thoroughness of his effort, the directness and plainness of his description and absence of any unnecessary words. He has succeeded in every way in making this paper one of greatest practical value.

Dr. Silverman, Atlanta, Ga.: Since I am to clinic for you tomorrow on this subject, I will at this time only say how much I have enjoyed Dr. Blum's papers and clinics, both here and at the recent National meeting in Rochester. In the south we are using this most efficient form of anesthesia quite estensively; in oral surgery and in ordinary dental operations such as sensitive cavity excavations, extractions, implantations, etc., it is especially indicated. In the Brophy clinics in Chicago we have employed conductive anesthesia for the various operations presented, with unalloyed satisfaction to both operator and subject. Dr. Blum has called your attention to some few misleading statements that are unfortunately present in the latest Fischer edition. Especially is he correct in criticising the failure to include directions for a buccal injection in the mandibular technic. For, while in many instances a simple mandibular injection will suffice, on the other hand in about 75% of cases a buccal injection in connection will not be superfluous. Thus, too, is it necessary ofttimes to aid the tuberosity injection with a few drops of the novocain-suprarenin palatally. In thousands of injections and where I have used as many as 14 syringefuls of a 2% and 30 syringes of ½%, I have yet to see even as much as a partial faint. And until I do, this procedure with me will be the method of choice.

Dr. Charles K. Teter, Cleveland: I think the dental profession should feel extremely proud of the fact that we have men in our profession who are expert along many lines. I think this fact is fast putting the dental profession in the minds of the laity where it rightfully belongs, as really a branch of medicine, and it is through the efforts of such men as Dr. Blum that this is being brought about. I want to congratulate the doctor on the concise and scientific manner in which he has presented the subject. I am glad to hear him say this is *not* perfectly simple, and that anyone cannot use it. He emphasized the fact that if we are going to use this with success, we should receive instructions in its use; otherwise we will not be in a position to tell the merits or demerits of the method. It is a valuable addition to the many methods we have in dentistry, and I do not think it has come for a day. It will stay, but it will take time to induce the average man to adopt it, for he is not willing to give this subject the time, attention and study he must give it if he is going to be successful with it. In the hands of an expert there is practically no limitation to this anesthetic. One may say that this is true of any other method. As a man becomes expert with any method, the time will arise less frequently for the need of any other method. I do not mean you need discard one method for another, for there are always times when one might be indicated and the other contraindicated. Dr. Silverman has been more fortunate in his cases than I have, for I have had some cases of syncope. I do not think they were due to the solution, because I have had friends of my patients, who didn't see a drop of blood or smell anything, but who became extremely colorless and you had to catch them or they would have fallen to the floor. I have had patients faint when using this solution, but never with other alarming symptoms, and always with complete recovery. I would like to know if Dr. Blum has made any cultures of the mouth after using iodine to sterilize the tissues. In my work with the general surgeons, it is generally recognized that unless the surface is dry to which the iodine is applied, you do not get much of a germicidal effect. As generally used the tissues are not dry, and you wouldn't get very much sterilizing effect from your iodine, and I think you would have better results by mechanically cleaning the gums and tissues with alcohol and keeping them dry, than by applying the iodine.

Dr. Brophy: I have never been much of an advocate of local anesthetics for operations of considerable magnitude, because in my early experience I saw some most unsatisfactory results. When cocain was first employed, its use hypodermatically was attended with some very serious consequences. Perhaps today there are people suffering from the effects of the injudicious use of cocain. So I was not favorably impressed with its use, hypodermatically, and haven't used it for many years, though I myself never had any very grave results from its employment. Now, with modern methods, and the use of novocain in the hands of experts, we are securing excellent results. I have been in Germany each year for the last number of years, and have studied there the use of local anesthetics. In the clinic of Prof. Bier, who is now the Surgeon General of the German army, these anesthetics were employed most satisfactorily, and so successful were they in major operations that I really became deeply interested in them. The explanations given by Dr. Blum with his demonstrations, which are, I think, of great scientific value, followed by the reading of his excellent paper, will bring local anesthetics, the use of novocain in particular, prominently before the profession. If I say anything on this subject more than to commend it, I must say that I fear some bad results may follow, for the reason that I fear—and I have had occasion to take this position—that there may not be such care used in asepsis as there should be. I see so many evidences of carelessness about me in my own work; those who assist sometimes become careless in the handling of instruments, in the bringing of the hands in contact with things that are not surgically clean, and so if

I say one word of warning upon this subject, it will be not against the use of the agent, but a word of precaution regarding the question of absolute surgical cleanliness, sterilization of everything, the keeping of all things sterile that are used in the operation. Some extensive operations have been made recently with novocain, and in the hands of one who is cautious in the preparation of his remedy, his instruments, in the maintenance of absolute asepsis, I think most favorable results will come. Yet in the application of the needle, in its adjustment and in the operations upon the parts, one must constantly keep in mind his anatomy, and make no mistakes by reason either of a lack of knowledge of the anatomy of the parts or carelessness. I think almost every one is apt to be a little careless in doing things when he is doing them all the time; but we cannot afford to omit any of those essentials in the use of injections such as we have heard discussed today. Personally, I wish to pay my respects to the author of this paper, and to say that too much credit cannot be given to a man who will evolve such work as he has exhibited today. The anatomical specimens which he has shown us have been so beautiful and so instructive, and the use of the needle, and his demonstrations have been of a kind that will be memorable. I want to say that the dental profession is deeply indebted to him for what he has done, and I am sure wherever he may go there will come to him expressions of that appreciation.

DR. BLUM (closing): I think the gentlemen have been rather too kind in their discussion of my paper. In speaking of infraorbital anesthesia, Dr. MacMillan said he has abandoned it in all cases, except in large necroses, and so on. Fischer, in his book on Local Anesthesia, especially in his second edition, which has been recently translated, is of the same opinion, but also includes "large abscesses in that region." Now, large abscesses are just the cases where I do not use infraorbital anesthesia, because with a large abscess ("schweren Abszessen") we, as a rule, also find a cellulitis of the region which we inject for infraorbital anesthesia. Fischer also says that he doesn't use conductive anesthesia as much in the upper as in the lower jaw. I differ with him; I have found conductive anesthesia most serviceable in the upper jaw. It is not so easily obtained as in the lower, but in all cases where conductive anesthesia in the upper jaw is indicated, we use it, except in bicuspid teeth, as I have mentioned in my paper. I had occasion only last Saturday to open the antrum in the molar region for a physician by giving tuberosity and infraorbital anesthesia, because I had to extract the second molar and second bicuspid on that side, and I also injected the palatine nerve, and without any trouble—the patient was very nervous; physicians and nurses, you know, are the worst patients—but there was no sign of pain. I extracted the teeth and opened the antrum very widely from bicuspid to molar.

I cannot agree with Dr. MacMillan in that he wants his patient to open his mouth as widely as possible. I think that makes it rather difficult to give the anesthesia, because the tissues are too much on a stretch. We want to have the patient open quite far, but not as far as possible, for that reason. Another statement in regard to mandibular anesthesia was to inject as high as possible. The point of insertion should be one cm. (rather a little less than more) above the occlusal plane of the lower teeth (Seidel).

I haven't mentioned the use of a general anesthetic for our work, and especially for all surgical work; it is foolish for anybody to throw away a good nitrous oxide machine, because we have cases where we must use it, and while I do not think I make use of nitrous oxide in more than a dozen cases a year, I still would not be without it. Conductive anesthesia is not the only method of anesthesia. I can only agree with Dr. Teter as to instruction. When I said instruction I meant the average dentist. There are plenty of men who do not need instruction; many men know the anatomy, and if they do not, they study it, go to the dissecting room and dissect for a few weeks, and then by practice they will get the experience. But the busy practitioner hasn't the time to go into details himself and go to the dissecting room or the hospital, and it is easier for him to have somebody else work it out; show him the specimen and have the first few injections done under the supervision of a teacher.

As to iodine, of course we do not expect to get in the mouth as thoroughly an aseptic condition as we can on the skin of the body. The main aim is to clean off in a mechanical way the surface and get as much antiseptic effect as we possibly can. Asepsis, as Dr. Brophy has told us, is the main thing we have to work toward in this particular branch as in anything else.

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140 West 57th Street, New York.

REPAIRING BROKEN PIN FACING IN THE MOUTH*

BY E. P. MARCILLIAT

This is a repair of a broken pin tooth by the use of Steele's interchangeable tooth. First, grind the gold down smooth; then take an impression of this smooth surface with modeling compound. Pour your model and select facing to fit the case in size and shade desired. Then, after you have the facing, take a small piece of wax, place on your smooth surface, take facing and gradually press into place. Chill with a water syringe and remove facing, the same as all Steele's, that is, remove it in the opposite direction; that leaves our slot reproduced in wax on our smooth surface. Then with the drill that comes in a repair outfit that fits a right-angled end piece with a firm grip, make a mark on the gold about 1-32 of an inch from the top of slot; then another mark about 1-32 of an inch from the bottom of your wax slot. Then remove the wax and follow up the marks to the desired depth of screw. Then, by the use of the thread cutter of the said set, make the threads in each of the holes. After we have the threads cut, take a screw, and by the use of a small screwdriver, place in position the two screws which answer the purpose of the slot of the Steele facing. Then cement facing in position, giving a very desirable piece of repair work.

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*Clinic Kentucky State Dental Society, 1914.

THE INTERPROXIMAL SPACES*

BY DR. E. P. DAMERON, ST. LOUIS, MISSOURI

IN MUSIC THERE ARE FIVE LINES and four spaces upon which are placed notes which, when sounded upon an instrument, give to us all the airs, tunes and harmony of that beautiful art.

In the mouths of normal adults there are thirty-two teeth and thirty intervening or interproximal spaces upon which the dental surgeon can practice his art and wiles, and all the beauty and harmony of music and the comfort and service of dentistry depend alike upon the skill of the performer, and the lack of skill in either field brings forth discord, distress and damnation.

My subject is the Interproximal Spaces, but contact points are so vital to such spaces that reference thereto is essential to the subject.

In the normal mouth the alignment and shape of the teeth in the arch are such that their contacts should resemble the contact between balls or spheres, located occlusally from the gingiva, and, in the posterior teeth, somewhat buccally as well as occlusally.

In restoration work the proper location of contact points is of greatest importance, and yet I am sorry to say there are men in practice who seemingly know as little about proper contacts as a goat does about cream puffs; in fact, it was only a few short years ago that I discovered for myself (after having been robbed of some perfectly virgin contacts) the existence and value of contacts and interproximal spaces. Prior to that such things were only hearsay to me and I fear that many of my patients thought I must be in partnership with toothpick makers.

With the teeth in normal contact there is a pyramidal or triangular space between them extending from contact to gingiva, a space which is not a space, for in normal conditions it is occupied by the septal gingiva; but in the abnormal, which is most often presented to us, is filled with salivary calculus, amalgam, gold bands and embryo fecal matter. In fact, in but few cases do we find normal conditions; rather we find a great variety of disturbances of the gum septum and are called upon to afford relief.

Two evils are apparent following loss of proper contact. Probably first is injury to the gingiva, then caries of the adjacent teeth, due to food debris, these followed by a series of pathological conditions which cause the patient much uneasiness and the dentist much work and worry to successfully combat and correct.

Some of the causes of improper or imperfect contact which permit the invasion of the interproximal spaces I have observed are: Malposed teeth, due to neglect during permanent tooth eruption time; imperfect restorations by fillings, such as too much space at contact, flat contacts, square contacts, contacts too near the occlusal or too near the gingiva, contacts extending full length of the crown of the tooth, etc; the placing of two gold crowns approximating without allowing septum space; contacts worn flat on otherwise sound teeth; tobacco chewers especially wear the teeth down to flat square planes and all contacts are destroyed, and in time cavities appear just below where contact points were and "Heck" is to pay.

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*Read before the St. Louis Society of Dental Science

Loss of the first permanent molar is a very frequent cause of lost contacts and destruction of gum septum. Save the Babies! Later, loss of the third molars is just as frequent a cause of trouble. These teeth act as a keystone in the arch, holding the teeth in firm contact, and when lost, the other teeth have a tendency to separate a bit and permit food to wedge between them. Since they are the "wisdom teeth," it is surely wise to preserve them. The loss of any tooth is bad, for the approximating teeth separate and the occluding tooth elongates, spoiling its contacts, and permitting nice little food traps to be established on either side so that their possessor has to stop between bites and "pull the chain," as it were, by using a toothpick as a first aid to the injured.

Pyorrhea alveolaris has spoiled many a happy family of contacts, and Belgiumized whole areas of interproximal spaces, and when once intrenched all hope of restoration goes aviating.

Partial plates are great invaders of septal spaces when made with nice little saw-tooth projections that fit snugly between the natural teeth. They ride the delicate little kindhearted gum septum to a finish, and at first it swells up in importance and pride at the load it is carrying, but finally succumbs and naught is left but space, which is soon filled, even as a cesspool overfloweth.

Dentists themselves are often the cause of interproximal space trouble in scaling teeth, fitting bands, grinding for crowns, etc., gleefully slicing away gum septum or peridental membrane, and lost comfort seldom is regained.

In addition to many and varied mechanical causes of interproximal space trouble, old "Billy Bacterium" manages to get in a lick once in a while and we have manifestations of what he can do in his infectious way, but if we are good guessers we can usually find an exterminator for him.

My old preceptor was not a good guesser in this connection and always greeted such cases by saying, "Well, I'll be damned." After I had attended college I learned that profanity was not the accepted remedy for such cases, but belonged to the mechanical cases exclusively.

One of the worst complaints of the interproximal space is either too much space or not enough space. The old lady said, "There's reason in all things, even in 'bilin' eggs'," so there is in spaces between the teeth. It is then our plain duty to maintain space of the right length, breadth and thickness as the geometrician would put it, and to do this we must exercise our ingenuity, digital dexterity and horse sense. The best way to fill the interproximal space is not to fill it at all, but do as the park keeper's helper wanted to do with the gondolas, "Give 'em a start and let nature take her course."

When you insert your fillings, look to the contacts and provide septal room; when you place two crowns approximating, look to the contact and leave plenty of room for the gum septum. Soldering the two crowns together at contact is sometimes advisable, for they frequently separate. Restore mesio-distal breadth of the tooth and leave no overhanging margins under the gum septum, or above it either, for that matter; cut off the pointed projections of partial plates, save the sixth-year molars and if they must come out, replace as soon as possible to prevent displacement of other teeth, and save the third molars. Grandma, who once said, "Wisdom teeth hain't no good," passed away long ago. Break your back but save them and the exodontists will still have plenty to do. I, personally, am a victim of misplaced confidence in grandma.

Polish to a "smoothness" every restoration that reaches the gum margin; the gum is not a clinging vine and does not require corrugated or serrated surfaces to hold it in place.

Make all surfaces just as smooth as you think you are, and the gingival septum will rise up in its interproximal space and call you blessed.

CANCEROUS AND PRECANCEROUS LESIONS OF THE MOUTH AND LIPS*

BY W. D. GATCH, M.D., INDIANAPOLIS, IND.

THE MEDICAL PROFESSION is at present making a systematic effort, in practically every civilized nation of the world, to inform the people in regard to the urgent necessity of seeking surgical attention early in the course of malignant disease.

This propoganda is based upon two facts which are now definitely established:

1. That most, if not all, malignant growths can be cured if they are thoroughly removed before they have had time to spread beyond limits close to their margin; and,

2. That few malignant growths can be cured even by the most thorough and extensive operation or by any other means, once they have spread beyond local limits.

To reduce the present dreadful mortality from cancer becomes, therefore, largely a matter of getting the patients early. This gospel cannot be preached too widely or too often. And we may add that every dentist should be a minister to preach it.

The dentists have a unique opportunity to educate the public in regard to this important matter. In the first place, practically the entire population seek their services at rather frequent intervals. The dental profession can, therefore, by organized effort, give the greatest possible publicity to the essential facts concerning malignant growths. In the second place, the operative field of the dentist—the mouth, lips and jaws—is one of the most frequent sites of cancer, so that the dentist, by recognizing these lesions early in their growth, can prevent a vast amount of suffering and loss of life.

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*Read before the Indiana State Dental Society, 1914.

The outlook for a cure of cancer of the skin or of exposed mucous membrane is a great deal better than for cancer of internal organs, for example, of the stomach or uterus. In the latter situations the growth may give practically no indication of its presence till it has progressed beyond hope of cure. On the skin or on the mucous membranes of the mouth, however, the lesion can hardly escape the notice of the patient soon after its appearance, and if he consults a dentist or a physician about it, there is at present no excuse for the latter to allow the lesion to progress beyond local limits. But "watching a growth for signs of malignancy" is still too often the prelude to a fatal ending. For the text book signs of malignancy—ulceration, glandular enlargement, general cachexia, etc.—are also signs that the growth has progressed too far to be cured.

But perhaps I should pause here long enough to support the foregoing statements with some trustworthy evidence. This is quite easy to produce. Let us consider for a moment cancer of the lower lip. Bloodgood has very recently treated this subject in a thoroughgoing manner, basing his conclusions upon a study of 200 cases. To quote him:

"An investigation of carcinoma arising in any locality of the body should have for its object the determination of whether permanent cures have been accomplished, the per cent. of these cures, and what were the causes of failure to cure. So far in this investigation I have determined that the two chief causes of failure to cure are late intervention, and no matter what the stage of the intervention, in complete surgery for that stage."

In a group of twenty-one cases in which the local lesion on the lip and the glands of the neck were removed, and in which the glands were found to be free of cancer, there were twenty cases (95%) of five years' or more duration. The one failure to cure was due to a local recurrence in the lip, due to taking too narrow a margin of healthy tissue. These results demonstrate that cancer of the lower lip can be cured in practically 100% of cases if operated upon before glandular involvement has taken place.

In a second group of twelve cases treated in the same manner and in which the glands were found to be cancerous, only six cases (50%) were cured. There could hardly be a more striking demonstration of the value of early operation. Cancer of the lower lip is curable in a larger percentage of cases than in any other situation. This is because the tissues of the lip offer a greater resistance to the growth. But the results we have just given are comparable to those of the treatment of cancer elsewhere. Thus cancer of the breast in its early stages, before the lymphatics of the axilla have been involved, is curable in 75% of cases; often this is perhaps 10%. We can most readily understand the necessity for the early removal of cancer by a study of the manner of growth of the same. It was formerly supposed that cancer cells may early gain access to the blood stream and be carried thereby to all parts of the body, where they give rise to secondary growths. It has been demonstrated, however, that while such metastasis by the blood stream is possible, it occurs but rarely, since cancer cells which get into the blood are surrounded by a mass of thrombus and killed. Cancer spreads by a creeping growth along lymphatic channels. Every part of the growth is in connection with any other part; to cure it it is necessary to extirpate the entire lymphatic territory involved in one piece—lymph vessels, glands and all the surrounding tissues. This view makes us understand the possibility of a surgical cure of cancer, provided the lesion is attacked before the growth has progressed too far. On the other hand, if we believe that cancer is spread by the blood stream, we must take a hopeless view of all efforts at cure.

Sarcomas, in sharp contrast to cancers, are spread by the blood and this makes their operative treatment exceedingly unsatisfactory.

But to return from this somewhat general discussion to the subject immediately in hand—cancerous and precancerous lesions of the mouth and lips. What do we know about the cause of such growths? There is at present a great and constantly growing body of evidence that their development is dependent on chronic irritation of some sort. Nearly every patient with cancer of the mouth gives a history of such irritation.

SYPHILIS

It has long been known that cancer is liable to develop into scars or tumors of the skin. Cancer of the lip frequently develops in burns caused by the hot pipe stem. The "paddy pipe," with a short cane stem, is peculiarly liable to cause such burns. In the mouth the lesion known as leucoplakia buccalis, popularly known as "smoker's tongue," is thought to have a syphilitic basis. But the condition does not yield to anti-syphilitic treatment, and is probably due in most cases to excessive smoking or the habitual use of hot drinks. The lesion, which owes its name to its white appearance, consists microscopically of a thickening of the epidermis. It gives rise at times to cancer. Other chronic lesions of the mouth are caused by the constant irritation of the cheek by carious teeth, by the holding of a quid of tobacco in the cheek, by holding nails in the mouth, etc.

The term, "precancerous lesions," has been coined to describe conditions of the kind we are considering. The term is a good one because it calls attention to the dangerous nature of the condition; it designates and emphasizes the fact that every cancerous lesion at some time in its history is either of a benign or of a strictly localized character. In this case the ounce of prevention is worth many times the pound of cure.

The dental profession has a great opportunity, and, I may add, a great duty, to perform in putting these facts before the public, in preventing chronic sources of irritation in the mouth, or removing these same sources of irritation, and in having the patient seek early surgical advice whenever he has a lesion which can possibly be cancerous or precancerous. It is my belief that by proper co-operation between the dentist and the surgeon, the mortality from cancer of the mouth can be cut in half. And the role of the dentist in bringing about this result is more important than that of the surgeon.

The diagnosis of a cancerous or precancerous lesion of the mouth is seldom a matter of difficulty. By the observance of a few general principles a practical diagnosis can always be made. By a practical diagnosis I mean one which will enable us to apply the appropriate treatment. It is a safe rule that any lesion of the mouth which shows a tendency to become chronic or to increase in size is to be regarded as possibly, or probably, cancerous or precancerous in nature. These lesions originate as areas of thickening in the epidermis, which soon break down, forming shallow ulcers. Syphilitic and tuberculosis lesions are now-a-days quite readily distinguished by laboratory methods from malignant conditions, though the diagnosis may be impossible from the gross appearance. Sarcomas about the mouth originate about the deep parts and clearly involve the mucosa secondarily. The same is true of odontamata. The X-ray as a rule presents a ready diagnosis of the latter. We may remark that cancer very seldom originates in the gum, though cancers of the cheek or tongue often grow into the gum. The term epulis means merely a tumor of the alveolas. It is devoid of exact pathological significance, since an epulis may be a fibroma, a benign form of sarcoma, or rarely a cancer. The ordinary form of epulis is covered by healthy mucous membrane and this seems to distinguish it from cancer.

A word as to the treatment of cancerous and precancerous lesions—when once a positive diagnosis of cancer has been made, and provided it seems possible to excise in one piece the primary lesion, and all the tissues which can possibly be involved by the growth, then this should be done. Treatment, with caustics, the X-ray, partial removal with the knife, etc., cannot be too strongly condemned. Such tinkering with a cancer only stimulates its spread, and if it does nothing worse, allows the growth to progress till its cure is difficult or impossible.

Although, strictly speaking, it is not within the limits of this paper to speak of the non-cancerous lesions of the mouth, sarcomas or odontomas, it is perhaps not amiss to remark that the surgical problems which these present are of an entirely different character from those presented by cancer. These lesions considered as one group are to be divided into two classes: those which are so very malignant that a cure is practically impossible by methods at present at our disposal, and those which are so benign that they can be cured by a single local operation. It follows that in non-cancerous lesions we have everything to gain and nothing to lose by conservative treatment, and now-a-days this is the rule.

I shall now present the histories of a few typical cases of cancer of the mouth, hoping that the points mentioned in the foregoing discussion may be thereby emphasized.

Case 1. A man of 56, who four months ago consulted a dentist for supposed trouble with upper molar tooth on the right side. The dentist extracted two teeth, but the wounds left by the extraction refused to heal. The dentist treated them with caustics for about a month, and the trouble got steadily worse. The patient then consulted another dentist who referred him to a surgeon. The latter in turn referred him to the writer for diagnosis. There was a fungating mass situated over the process of the upper jaw and extending out into the cheek. A microscopic section of this showed squamous celled cancer. Since operative removal would have involved resection of the upper jaw and a large part of the cheek, and would have held no hope of cure and but little of making the patient more comfortable, it was not advised. Here the origin of the trouble was quite possibly the chronic irritation of the cheek by carious teeth.

Case 2. The patient was a man aged 50, of good habits, who had had disease of the right premolar tooth about five months before. The offending tooth had been extracted. When first seen there was a fungating growth involving the cheek and gum and firmly attached to the jaw. The sub-maxillary salivary gland was also enlarged. A two-stage operation was done. At the first sitting the sterno-cleido-mastoid muscle, the entire internal jugular vein, all the fascia and lymphatic glands of the side of the neck, the lower part of the parotid gland, and the sub-maxillary gland were removed in one piece, the cautery being used to separate the jaw from the tissues excised. At the second operation the affected half of the lower jaw, together with the primary lesion and a part of the cheek were excised. The patient made a good post-operative recovery and resumed his usual work. There was surprisingly little mutilation for the operation. Eight months after operation a growth developed in the pharynx and tonsil which rapidly proved fatal. There was no recurrence in the operative field. I regard this case, despite the fatal outcome, as an example of successful surgical treatment. For the operation relieved the patient of a foul growth in his mouth, enabled him to take food with comfort, and undoubtedly rendered his end far less terrible than it would otherwise have been.

Case 3. A man of 60, with a cancer involving his entire lower lip, symphysis of the jaw and base of tongue. The growth was the size of a man's fist. The patient had spent every cent he possessed for treatment with cancer pastes and came to us as a charity patient. The growth was covered with a foul smelling discharge, and prevented the patient from taking anything but small amounts of liquid food. Something had to be done. The primary growth together with the entire lower lip, the lower jaw from points about one inch in front of the angles, and all the tissues between the hyoid bone and tongue, were boldly excised in one piece, the skin being sutured to mucous membranes, without any effort to close the mouth. This left the tongue protruding fully, and at a second operation the anterior part of the tongue was excised, and a plastic operation done to restore the lower lip. The patient had to be fed for a long time by means of a stomach tube, but gradually learned to take food without it. At last account, about eight months after operation, he was alive and well.

Case 4. A man of 58, with a fungating growth of the lower lip of one year's duration. This started as a small papule at the muco-cutaneous border of the lip. Scales would form over this which would be pulled off, leaving a bleeding surface. The precise cause of the origin of the growth could not be determined. At operation a block dissection of the submental and sub-maxillary region from parotid to parotid was done and the primary growth was excised with a good margin of healthy tissue. In all about one inch of the lower lip was removed. This caused no noticeable deformity after the patient's beard was allowed to grow. The patient is well, one year after operation, and there is every reason to believe that he will be cured, since the lymphatics of the neck were found free of cancer on microscopic examination.

I could add many more cases to those given, but these are sufficient to enforce the most important truths regarding the origin, prevention and treatment of cancer of the mouth. It should be impossible now-a-days for cases like the first three to occur. Surgery on such cases is at best merely a palliative measure. The golden time for treatment has been allowed to slip past.

DISCUSSION

DR. C. J. LYONS, Jackson, Mich.: The subject which has just been presented to you is one of most vital interest to the dental profession.

A short time ago a prominent member of the medical profession made the statement that the next great step in preventive medicine should be made by the profession of dentistry. Tonight the essayist reiterates a statement made by Dr. Vilray P. Blair, who, in his text book on "Oral Surgery," says that it is mainly to the educated dentist, grounded in general and oral pathology, who makes a survey of the whole mouth, lips and tongue, that the medical profession and laity must look to reduce the now increasing death rate from cancer of the mouth.

What do these challenges mean to us? It means that the dentist must know more pathology, more histology and more bacteriology or in other words, be a keen observer and a good student if he will keep pace with medical progress. The medical profession is going to look more and more to the dentist to take care of the pathology of the oral cavity.

The dentist who recognizes these precancerous conditions and who directs his patient accordingly, is as deserving of a Carnegie medal as are those who save lives by more heroic measures. When an individual presents with these precancerous conditions, that person's life and future happiness is absolutely dependent upon the early recognition and treatment of that condition.

It is our moral duty to our patients, if we expect to do all we can for those patients, to make a full survey of the whole mouth, and whenever we find a lesion in that mouth that we cannot account for by general dental disorder, we should give to that lesion very careful attention. We often find an abraded surface in the mouth; we find them particularly in men who have let their teeth drift along, paying no attention to them up until forty-five or fifty years of age, when sometimes many cavities with rough margins may have developed. What does that mean? It means this, that any constant prolonged irritation, and this condition of the teeth will produce an irritation, predisposes to cancer. Now, it is our duty not to let any irritation from those teeth continue in the mouth that will predispose to this malignant disease. When we consider, on the one hand, the long period of immunity, or the successful operations that may be performed for these pre-cancerous conditions, and consider, on the other hand, its development, with the long months of suffering and the inevitable end of the patient, then it is our duty to humanity to be more on the lookout for these conditions than we have been in the past. Many times these conditions will slip through out fingers unnoticed. A patient, a lady, as an example, had what the dentist supposed to be an abscessed tooth, and treated as such without any benefit. She went through the hands of four dentists for this trouble, and the fifth finally suspected malignancy. It was two years before the real trouble was diagnosed. What was the result? The lady lost half of the superior maxillary and went through an endless amount of suffering. Had the first dentist done his duty and discovered some lesion there that he could not take care of by the ordinary dental treatment, had he suspected malignant trouble, and then directed that patient accordingly, no doubt she would be well and happy today.

How are we going to practically diagnose these conditions? Dr. Gatch has said nothing, has told us of no practical means, except what we can see superficially for diagnosing these cases. By that time it is too late. When we find these lesions of the mouth that we cannot account for, a microscopic examination should be made in every single case. That specimen should be sent to the pathologist, and if the pathologist diagnoses the case as malignant trouble, then the patient should be directed accordingly, and have that trouble eradicated. Too much time is wasted in these cases by letting them drift along and seeing what is going to develop. We must not wait a moment if we are going to do the best for those under our care. We must get after these conditions at once, and we may be the means of saving the lives of some of our patients. If in our entire dental career we could save the life of one patient by being able to make this diagnosis early, then indeed would the practice of dentistry not be in vain.

DR. J. P. BUCKLEY, Chicago: This audience has heard me so much in the last two days, and there are so many other speakers here that really have something to say, that I know you would much prefer not to have me enter into a discussion of this paper, but that we listen to the gentlemen who are here prepared to speak. So far as I am concerned, although I appreciate the importance of this paper, and have profited by hearing it, these people who want to speak are perfectly welcome to do so.

I appreciate its importance and its value. I couldn't enter into a discussion of this second paper without at least saying a word with reference to the little discussion we listened to from Dr. Emerson. It is no less than criminal the way some of the dentists in this country are using, without knowledge of the subject, vaccines in treating certain conditions. I refer particularly to the vaccine of pyorrhea, and I was pleased to hear Dr. Emerson, cautious and guarded though he was, say something, which, if we think of it and study it, will serve as a check on the over-enthusiasm in certain channels in dental practice today. A lighted torch in the hands of a blind man is a dangerous thing, and no dentist has a right to do some of the things that are being done. I have not used vaccine therapy, because I feel that I do not know enough about it, and no dentist has a right to employ a remedy unless he is familiar with all that pertains to that remedy. I appreciate deeply, and more than I can express, that discussion. Do you realize the importance of one thing to which he directed attention? A thing I tried to emphasize in a brief talk last week, when I told you that some of the men in the medical profession are up to date, because when they find a disease which they have been unable to find the cause of, because of some literature that has appeared in our dental and medical journals, they can lay the cause of that disease upon the dentist. Foci of infection about the mouth, due to careless dentistry; damage, it may be due to something about dental work—it may not; as Dr. Emerson has so forcibly called our attention to that particular fact. We must learn to do our work in the mouth as thoroughly as possible. We must learn not to be satisfied to get a portion of the pulp out and leave the rest in, depending upon the so-called permanent antiseptic power of some highly advertised root canal filling; we must go as near to the end of that root as we can, and remove mechanically all of the organic material, and fill that root with some material that will keep it in as nearly an aseptic condition as it is possible to do.

In discussing this second paper, I can say that both the dentists and physicians have been careless. I hope it has been only carelessness, in the way they have superficially examined certain conditions about the mouth. We have cases on record where physicians have diagnosed chronic alveolar abscesses that have discharged externally upon the face or about the jaws, especially the lower jaw, as a cancerous lesion, and treated them as cancers for months and years, only to find subsequently that that cancer was nothing more nor less than an alveolar abscess, and which so-called cancer was cured by the treatment of the abscess on the tooth. On the other hand, we have had dentists that had been treating certain conditions of the mouth for pyorrhea, some men who group all the diseases of the soft tissues of the mouth into one group, and call everything pyorrhea—when the condition had nothing practically in common with pyorrhea. I remember a case not long ago where we had a typical epulis. You could take that tumor, pull it back from the lower anterior teeth on the labial surface, and you could see that dark deposit almost encircling the root. That tumor had developed until it became so full that the upper tooth, every time the mouth was closed, would strike it, and the tumor was irritated by the fact that the upper teeth kept mechanically irritating it. That dentist had been treating that patient for a year and over for pyorrhea, and he sent him to me to cure the pyorrhea, because it was getting into that condition, because it was growing so that the patient could not eat. So I say both dentists and physicians have been careless or ignorant of the subject we should know about, and that is pathology. There is no such thing as dental pathology, but there is a science known and recognized as pathology, and dental pathology is pathology, and we should know more about that fundamental science. We cannot make a diagnosis definitely and positively unless we know something about pathology. We cannot treat a disease unless we are able to recognize the characteristic symptoms of that disease; in other words, we cannot treat a disease successfully and rationally unless we know what disease we are trying to treat. If any of us find a condition in the mouth that baffles us, or that we are unable to recognize, we should at least do what Dr. Lyons has suggested we do, we should send a specimen to the pathological laboratory, which we have in every large city at least, and have an examination made If we do not want to do that, we should turn that patient over to some one who is able to make a diagnosis, and I fear dentists do not do that as much as they should. They dislike to admit they are not able to recognize a condition, and they go on waiting to see whether the condition will not cure itself, hoping that nature will take care of it, until it comes to the point where even surgery cannot cure the disease. To call in a consultant or turn your patient over to some one else, either in the medical or dental profession, who is making a study of those conditions, is no evidence of ignorance on your part: on the other hand, it is an evidence of conservatism and of progress.

IMPACTED SUPERNUMERARIES*

BY H. T. NICHOLS

In this case there was one supernumerary between centrals, and the tooth was extracted, and two months later another supernumerary erupted just lateral to the first. The feature of this case is the health of the child. She was 12 years old. She suffered continually with headaches and earaches, and was extremely nervous, so much so that she was taken from school. After these teeth were extracted, and her mouth put in proper condition, her headache entirely disappeared and her general health improved materially. She is 15 years old, and in the three years' time all this change has taken place.

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*Clinic Kentucky State Dental Society, 1914.

REMOVABLE BRIDGE WORK AND ANCHORED DENTURES*

BY KARL G. KNOCHE, D.D.S., CHICAGO, ILL.

MY REMARKS WILL BE DERIVED almost wholly from clinical observations in an office where my function is the restoration of badly wrecked mouths. In my association with Dr. A. F. James I have seen much to inspire the effort which you have done me the honor to accept.

A few weeks ago I heard a noted Chicago surgeon say: "The physician of today and tomorrow, who allows one of his patients to have any one of the now preventable diseases, will have to answer seriously to that patient."

In our own great profession, we apply, theoretically, the principles of oral hygiene and prophylaxis. Yet, those who preach it most strongly may be the very ones to forget it entirely when arriving at a decision of what is necessary mechanically.

Familiarity with the mouths of patients who come to Dr. James with pyorrhea is sufficient evidence of the fearful havoc wrought by work of every variety; crowns, inlays, fixed bridges, partial plates; produced in many instances by conscientious, capable men. What, then, is wrong with the work of today? Much pointed and embarrassing comment is made on dentistry by such men, for example, as Dr. Hunter, in his paper on "Oral Sepsis," and while dentists could not repress some resentment, a careful and honest appraisal of the facts, mortifying though they may be, proves that he was right in most of his contentions.

Dr. Chayes, in his "Empiricism in Bridge Work," tells some startling things. Dr. Bush, of Columbus, has a few slides which he names his silent clinic; they justify a multitude of accusations leveled at modern dentistry and should cause a feeling of shame at much of the work done by its practitioners. Despite the light which is shed by the "newer dentistry," many are still going in the same blind way and in the same old ruts. How often are fillings perfectly trimmed at the gingival; perfectly carved to restore the normal occlusal contour, cusps, pits and fissures? Indeed, what proportion of dentists know the anatomy of the teeth well enough to restore the enamel lines of crowns, or the shape and forms? Seldom are artificial crowns made that even resemble the natural tooth. They are slapped on in a rush with straight sides, stamped cusps, and, worst of all, with bands standing away from the gingival and irritating the soft tissue as destructively as a sliver does the hand.

Fixed bridges are in common use when both clinical observation and common sense proves that the removable type is a thousand times better. Operative procedures remain much as they were twenty years ago, notwithstanding the great incentive which the new dentistry has given us.

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*Read before the Michigan State Dental Society, 1914.

Most certainly many paths leading to a solution are open and professional requirements as to prophylaxis and oral hygiene then will be consistent. This may seem to be a severe arraignment of practices which persist somewhat among the good as well as the bad and indifferent men. Yet what I have specified are but a small part of what should be condemned out of the bulk of the most recent work.

If all of you could see the botches that I see every day—work done by all kinds of operators (and, gentlemen, the advertisers' operations are in the minority and *not always the worst*)—you would agree with me that nothing is too strong to be said in condemnation of a system of practice in which lies so great a chance for ultimate failure, tooth and tissue destruction as prevails too commonly today. Hence, if I could not throw a small ray of light along paths that at least lead toward the consummation of the ideal, I should not be here.

Incidentally, I shall show you a few of the methods we have applied to our cases, and which have been of great benefit to our patients, as well as a source of confidence in ourselves. There can be no great claims to originality since it is simply a story of development after much thought and investigation. A few instruments I have been forced to design in order to carry on the work successfully.

I believe one of the greatest reasons for mechanical failures is found in the neglect to study the mouth in its entirety as an organ. One tooth is treated, or several teeth, and it is felt that everything necessary has been done. In other words, the relation of dentistry to the mouth often is exactly the opposite to that of medicine to the rest of the body. Again, why regard simply the mechanical aspect of the work and never think of its physiological relation to the soft tissues and to the teeth involved? There are men today specializing in pyorrhea who do not supervise the mechanical restorations that are necessary in most of their cases, and who fail many times in their pyorrhea results simply because of their neglect. They refer a patient back to the man who, in the first place, did not believe himself able to subdue the conditions. Dentistry has many branches but only one trunk, and these men are practicing as if they grew in different forests. They are apart, instead of together, and lessen the chance for the best results, by a lack of co-operation. We know that any disturbance in the mouth impairs its functions as a whole; the loss of a single tooth, or the loss of the gingivæ and of the alveolar process in pyorrhea, by making it impossible to cleanse the parts, impairs the function of the masticatory organ which then goes from bad to worse. We know that the digestion and proper preparation of food in the mouth is absolutely vital to its successful digestion in the stomach, and intestines; so any disturbance of the first phase means abnormal nutrition. Knowing this we must acknowledge that a preliminary to successful operations in the mouth and on the teeth, demands a general recognition of physiologic conditions precisely as in any other operation upon the rest of the body. This must be emphasized as the true foundation of operative dentistry; the necessity for all operations to be so done as to include extension for prevention, and the prevention of irritation or injury to the soft tissues; and to carry all this to an ultimate success means the application of correct mechanical principles. What I wish to emphasize is this: Every patient with an impaired masticatory organ presents a grave problem and one which has been regarded too superficially in the past. All factors that might enter into the truly successful treatment must have careful consideration.

An important adjunct, necessary to successful dentistry, is the possession of what are called study models. Orthodontists find them absolutely necessary, and so do we. These are prepared as perfectly as possible and mounted in an anatomical articulator with extreme accuracy, to reproduce the normal relations and thus contribute to an intelligent study of the planes and lines of force of the masticating stress. All of my practice is approached in this way; every case is planned from a model before any work of replacement is attempted.

Now that I have condemned and torn nearly everything to pieces, I will undertake an effort at reconstruction.

As you know, this paper is on removable bridges, and it is along this line that the completed work lies. But long before a satisfactory result was possible, it was necessary, in order to improve, to abandon much that was old, if not honored. The first was to eliminate banded crowns, and the production of a satisfactory root end attachment. Of course, it is impossible to fit a band to a root and obliterate the gingival margin of the band. It is true, also, that a cope swaged over the end of the root is not strong enough. Therefore, a method of preparing the root was designed, which made it possible to make a coping that would fit closely without any projection, and yet be as strong a support, or stronger, to the root, than a band ever was. This method provides a margin that is just as definite as a cavity margin, to which the gingival margin of the cope is trimmed in the same manner that we trim an inlay to the cavity margin. Thus we have a coping that cannot be detected any more than the enamel line can be, when passing a sharp instrument from the root onto the metal, and vice versa.

Our work is often called radical, and perhaps justly so, since most of the teeth to which bridges are attached, first are cut off, and this form of cope used. Whenever any part becomes a menace to health it is best out of the way; therefore, because the natural crowns of teeth qualify a successful result and so become a menace to the health of the patient, they are cut off. To leave the crowns standing and use banded crowns would produce diseased soft tissues and teeth. So they are cut off because a coping has been designed which never yet, when perfectly made, has resulted in a single instance of irritation to the soft tissues. This is one of my most interesting exhibits, and I will, for that reason, show it in detail with the lantern.

If we are honest with ourselves in making a choice between fixed bridges and removable bridges, we find that there is no escape from a definite, unqualified conclusion. Fixed bridges have inevitably produced many diseased roots and teeth and have prevented any permanent cure by interfering with the treatment of pyorrhea. They almost invite it! Have you not removed a fixed bridge (or had it drop out, roots and all), and run for the acid dish, holding the bridge at arm's length, and closed all the laboratory doors while boiling it in acid? It is necessary only to compare two mouths—one equipped with a fixed, and the other with a removable, bridge—in order to know. The first never can be kept clean, while the removable piece can be cleansed satisfactorily, since the perfectly coped roots and the piece itself present few places for the lodgment of debris.

There is another angle from which to look for a choice. Although nature sometimes deprives us of our teeth, she, in her bounteousness, has afforded a substitute in the dental ridges, that have been sadly neglected. Wherever there is a ridge of fair size, it should be utilized, because it was left there for use. If we fail to do this, if only for the help it can give in carrying the load, it will fail of stimulation and will be absorbed. If, however, we place a carefully fitted saddle, perfectly placed, over the ridge, and exercise the tissues, we stimulate the parts and prevent resorption. More of that later.

Fixed bridges serve a purpose; they save some teeth temporarily, and ruin many permanently. They help the health of some patients temporarily, but ruin the health of many permanently. Extensive fixed bridges should have absolutely no place in the operations of today. These may seem broad, harsh statements, but we need only look back upon work of the recent past for proof, for there may be seen a blaze of failure and destruction, and heart-breaking disappointments.

Let us consider now the principles of removable bridge:

1. It should be as entirely under the control of the patient, and as simple in principle, as possible.

2. It should have broad, perfectly-fitted saddles, and the anchorage teeth should not be called upon to carry more than their individual load during the act of mastication.

3. Provision should be made for tightening, because of the likelihood that the parts will wear from the friction due to removal and replacement. Therefore, there must be adjustable or replaceable parts.

4. The work should be done with anatomical articulation, carried out to its fullest promise, for the indubitable reason that a disregard of this principle means ultimate failure.

The above principles meet all requirements and still allow a broad latitude for excellence of mechanical workmanship and esthetic results. The working out of these principles I will endeavor to show you with the help of slides, but I wish to speak now of saddles and dispose of the statements that resorption takes place under them. When properly made and adjusted with relation to its anchorage a saddle provides the soft tissue and bony ridge with the exercise and stimulation necessary to prevent resorption. Resorption of the tissues does not take place under a properly fitted saddle.

How is this to be attained? Take an impression with modeling compound and *never* trim the model obtained from that impression. I thoroughly condemn the trimming of saddle models, because mere man cannot have such a knowledge of the tissue as to determine just where and how much to trim. In fact, whoever has such knowledge is of a divine nature. Seriously, it is owing to our having trimmed models for saddles and so applied pressure unevenly (which means wrongly) that resorption has followed.

In order to place a saddle in the right way, force it hard upon the ridge, blanche the soft tissue, applying a force equal to the full force of mastication, and in that relation attach it to the anchorage crowns. This saddle will be driven tightly to place under the full force of mastication, and its pressure will be relieved slightly, owing to the elasticity of the connective tissue, when that force is removed, creating a pumping of new blood into the parts, stimulating and invigorating the tissues involved, and so preventing resorption.

You may have been bored by the mass of detail I have given you. But, ladies and gentlemen, it is only a small part of the detail necessary for complete success. Dr. Owre, Dean of Dental Department, University of Minnesota, has a formula for success or its degree, which is, "Attention to the Minutiæ and Details." It was his motto that the degree of success is in direct ratio to the amount of attention to minutiæ and details given.

I think whatever we do, especially in the mouth, should be done with every nerve keen to discover some point that we might improve upon, and no amount of care and labor should be spared to do the thing as perfectly as possible.

I will close with the formula before given, "Attention to Minutiæ and Details."

DISCUSSION

Dr. E. B. Spalding, Detroit: It is a privilege for us to have two such well-known men as Dr. Ash, of New York, and Dr. Knoche, of Chicago, on the same program.

They bring us their latest thoughts on a subject—removable bridge work and anchored dentures—which has been going through considerable evolution the last few years, and the efforts of these two men have aided materially in this change. Many of us have profited by the clinical demonstrations of both Dr. Ash and Dr. Knoche, have listened to them with much interest this morning and are awaiting with anticipation their clinics tomorrow.

As I am to confine my discussion to Dr. Knoche's paper, I will say that he has painted past and present operative dentistry in a very dark color. He cites the many examples of awful havoc wrought by bad fillings, crowns and fixed bridges, which come under his observation in the mouths of patients who come to his office for relief, and he concludes that there is something "rotten" not only "in Denmark," but in the United States.

I am not going to dispute this for I am sure we all agree these conditions have existed and do exist in altogether too large a per cent. of dental work, and to a greater or lesser degree will always exist as long as dentists are recruited from human beings, but it is the duty of every man to improve them as far as it is in his power, by raising his own and his brother dentists' ideals.

I want to say to Dr. Knoche, however, that it is hardly fair to judge all dentistry by what he sees in his office, for he is associated with a specialist in Riggs disease and their office is a Mecca for those having wrecked masticating organs, but the many not requiring their expert skill worship at other shrines.

If we would go to Chicago and visit certain sections of the city we would see many moral and physical wrecks, but it would be manifestly unjust to conclude that all Chicago citizens were of this class.

I gather from his paper that Dr. Knoche practically condemns all forms of fixed bridge work and while I grant him that much fixed bridge work is accountable for Riggs disease and the destruction of not only their own abutments, but many other teeth, yet I do not believe that the removable bridge is the thing to use in every case, nor for every man to attempt. It requires more accuracy, more skill to make an average removable bridge than an average fixed bridge, and if in every case of fixed bridge work a removable one had been tried, there are many patients who would be wearing their bridges in their pockets rather than in their mouths. I will anticipate Dr. Knoche's answer to this that the abutments would last longer in the case of the removable appliance, whether worn or not.

Most of us have in mind cases of fixed bridge work which has been worn for many years; possibly we have been fortunate enough to have made some of them, and yet there is no pyorrhea about the abutments. I have in my own mouth a fixed bridge which I have worn for fourteen years and I expect to wear it fourteen more. I cannot think that I would prefer a removable piece in my case in spite of the fact that, in Dr. Knoche's own language, "it is entirely wrong from every moral and mechanical standpoint."

Another sweeping statement made by Dr. Knoche is that "those who preach oral hygiene and prophylaxis most are the ones who lose all thought of it when it comes to the consideration of what is necessary in a mechanical way." I dislike to think Dr. Knoche meant that statement to be quite as strong as that. I have been preaching and practicing oral prophylaxis in as earnest a manner as I have been able for over ten years and we have tried to practice it from as broad a viewpoint as possible which included much thought on all mechanical operative work. I, for one, deny the charge, and I imagine there are others present who will do so. Possibly Dr. Knoche meant the man who practices prophylaxis *with his mouth* rather than *in* the mouths of his patients.

What has brought about all this destruction of teeth Dr. Knoche has told us about? It cannot be laid at the door of either fixed or removable bridge work, or any other particular kind of work. *It is because of too low ideals, lack of judgment, lack of skill and ignorance.*

Dr. John M. Riggs, in 1844, tried to teach dentists how to cure and prevent pyorrhea, and yet a large per cent. of the profession does not know the first principles of it yet. When a dentist does know the first principles of oral prophylaxis, that is, gotten beyond the idea that it is "cleaning teeth," and he is honest, he will not put a band on a root so that it is an irritant to the gum and peridental membrane; he will not confine septic material in a root canal and hide it with a crown, nor leave over-hanging margins to his fillings, nor fail to restore point of contact and occlusion, nor put a fixed bridge on teeth susceptible to pyorrhea unless it is constructed so it can be kept clean and he makes it his business to see that the patient knows how and does care for it properly. Furthermore, if he is honest, and he sees a condition which he feels he is not sufficiently skillful to cope with, he will refer his patient to some other dentist who is able to give him needed service.

While I have taken exception to some of Dr. Knoche's general statements, I do not want to be understood as not in favor of removable bridge work and anchored dentures. I most emphatically am in favor of them. I am an admirer of Dr. Knoche and of his system of work as it shows great skill and judgment. I most heartily agree with him that when the teeth as a masticating unit have lost their usefulness, to level them to the gum line is often the only correct way to build up proper occlusion and give the patient a useful masticating apparatus. This seems very radical, and probably is not possible in all cases, but it is the ideal for which we should strive.

Dr. Henry W. Gillet, of New York, read a most excellent paper on this subject before the Northern Ohio Dental Society last spring, and I wish to quote him as saying: "I desire to forestall here one point that is likely to be made in discussion, namely, that the full accomplishment of what I am about to advocate is possible to only a limited portion of our clientele, and of the practitioners of our profession. This I unhesitatingly acknowledge as a fact, but I hold it to be an ineffective argument as against the wisdom of formulating and advocating the most efficient plans possible for the attainment of the desired end.

"I also further reply in advance to this mythical critic that he has no means of knowing how our clientele will respond to a need once it has been made clear to them. I predict that when the dental profession or its active third finds itself and is able to say, with that assurance based on the certain knowledge of facts which invariably carries conviction to the hearer, 'Your continued health, even your life, depends on the elimination of these ill conditions and the establishment of a better state of affairs,' then there will be the same acquiesence from them as in the case of the surgical operation necessary to continued life and health."

If normal occlusion is good for the child, why, when a person has reached middle life and past, and the digestive organs do not function as readily as in youth, is it not even more necessary to have teeth with the best possible occlusion?

Occlusion without the bridge, saddle or appliance held rigidly in position and able to stand the stress of mastication, is of little or no use. If the few remaining teeth or roots are made to receive the whole stress their attachment will soon be destroyed, but if these roots can be made to retain a denture and yet transfer the stress to the alveolar ridge by means of an accurate-fitting and properly adjusted saddle, then the conditions are most propitious.

These conditions Dr. Knoche seems to be very happy in bringing about by his system, but, like many others of the recent achievements in dentistry, should not be attempted without much thought and study of the detail and technic. Only those who are skillful in their other lines of work can hope to be successful in this.

With all the latest ideas in every line of dental work demanding greater effort on our part to meet the exacting requirements in technic, we bid fair to be very busy keeping up with the procession.

As to the detail of Dr. Knoche's work, I will say that I have not been successful in constructing his root copings that fit with anything like the accuracy he gets, but I know the fault is with me, and I hope with some suggestions he has given me this time I may have better results. The post Dr. Knoche uses to hold the coping to the root appeals to me as altogether too small. We all know that a small post is very liable to become loosened in a canal because there is not the surface for frictional fit and attachment of cement. However, if he does *not* have trouble, my fear is not well founded, but from experience in crown work, I am a firm believer in a large and very accurate-fitting post for roots.

The best argument I have concerning the work of Dr. Ash and Dr. Knoche is to urge every man present to be sure and see these men clinic. If anyone has a thought of not remaining at the meeting until after the clinic tomorrow it is because he does not know what interesting things these two essayists have to show us.

A NEW IDEA FOR MAKING GOLD INLAYS*

BY F. R. WILDER, LOUISVILLE, KENTUCKY

This is a method of making a perfect gold inlay. The cavity is prepared as usual for a cast gold inlay; then burnish a 36-gauge pure gold plate into the cavity as nearly as possible, and then place your wax in, as you would for an ordinary mold for gold inlay; remove the piece from the tooth and cast as you ordinarily do for cast gold inlays. Next replace it in the tooth and the pure gold plate which overlaps the borders of the cavity is burnished thoroughly to the cavity. By this method you get a perfect adaptation.

*Clinic Kentucky State Dental Society, 1914.

GENERAL CONSIDERATIONS OF CAVITY PREPARATION*

BY DR. THOS. P. HINMAN, ATLANTA, GEORGIA

I WILL ENDEAVOR TO PRESENT to you certain principles in connection with cavity preparation. These principles involve the things that are tried and true. I am not presenting in this my own work, but the work of others, and I hope to be able to present it in a way that will be comprehensive.

Before we go into the subject of cavity preparation, there are one or two things I would like to mention in reference to the handling of cavities in general. First, and I believe one of the most important subjects, is that of separation. Years ago immediate separation was used in a large number of cases. Immediate separation in place, as a general proposition, is one that should not be used to any very great extent. It is impossible to properly prepare cavities and restore the tooth to its normal function unless we have correct and full separation. The methods that I will mention are three, and three only. The older methods of separation by the use of rubber and wooden wedges I believe should be relegated to the scrap pile with those instruments that were used during the Inquisition. There are so many better ways of separation that I do not believe those should be used. I should have said there were four ways, instead of three, and I think the necessity never arises for the use of those old torturing methods of separation. First, I will mention the use of silk, and I will show at my clinic the Van Woert knot, used for separation.† This is a rapid and successful method where the cavities are not large. This method of twisted silk between the teeth will produce over night enough separation for all ordinary purposes. However, when the cavity walls have been broken down and the surface of the enamel has been lost, and the teeth have come together gingivally, and we have the typical gum condition we so often find, where the gum later becomes affected, producing loss of septal tissue, then others should be used. The best method probably is to use sea tangle tent. This is a highly compressed material used in surgery, and by cutting small blocks of this material and placing it between the teeth in the cavities, it being held in position by the use of temporary cement, we can, during a night, get sufficient separation and, besides sufficient separation, a pressing back of the gums, and it is the most satisfactory method of which I have knowledge. The use of silk and sea tangle tent I believe are the best methods. There are some cases, however, where even the use of the sea tangle tent is not satisfactory, on account of a considerable loss of the mesial or distal walls of the cavity, where the occlusal surfaces have been broken down, so that the borders of both cavities are nearly in contact. In cases of this description, if we attempt to fill without the proper separation, this situation arises: the inter-dental gum, known as the septum, never returns to its normal condition, and unless there is separation sufficient to release the inter-dental gum from pressure, and a restoration of the teeth at the point of proximal contact properly made, we can never expect that tooth or those teeth to return to their normal function.

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*The first of a series of Postgraduate Lectures delivered at Kentucky State Dental Society, 1914

†An illustrated description of this is given in THE DENTAL SUMMARY, June, 1914, page 424.—*Editor.*

I want to lay stress on separation. In some cases it is difficult to get separation, even with sea tangle tent, the most approved separating medium of which I have knowledge. These cases should be filled with gutta percha, preferably the old red base-plate gutta percha, and in some instances as much as two or three months allowed to remain in position, if necessary, to gain the right amount of separation. If you restore the tooth to its normal function it must be restored in a physiological way.

Before we go into the subject of cavity preparation, we should understand the structure on which we are working, and some of its physical properties. I remember when that propaganda of extension for prevention, which I believe is an incorrect nomenclature, was put out, it had a great many opponents among the older operators, and it today has, for the reason that it is not generally understood. I believe that the words, "extension for immunity," are the words that should describe this form of cavity preparation, because the object is to extend the cavities into immune areas. That is the basis and the foundation of cavity preparation, and is the thing I shall endeavor to have you understand.

To extend into immune territories, we must know what are the immune territories. If we know what the immune territories are, and extend our cavities into reasonably immune territories, then we have a permanent filling, and unless the cavities are extended into immune territory, we can never expect to have permanent fillings. We must understand the situation and position of the enamel rods, and their placing in relation to the dentine. Unless it is understood that the enamel rods are standing on end, and we prepare our cavities along that line, we cannot understand other things. There are some things about decay I want to describe briefly. Decay in the enamel and decay in the dentine are two distinct processes. Decay in the enamel takes place always from the outside. Gelatinous plaques are formed on the enamel surfaces. These plaques are filled with bacteria, bacillus lactici acidi. It is by the by-product of this bacterium that we have affected the cement substance that holds the enamel rods together. As it goes through, it penetrates in a triangular form, being more intense in the center, and as it penetrates beyond the dento enamel line, it spreads laterally and takes the same triangular form, going directly toward the pulp. We must understand that as the enamel is supported by the dentine, if we leave any of the enamel unsupported by healthy dentine, we have a frail foundation that will eventually prove our undoing. We must understand this fact: first, penetration takes place, then we get the lateral spread of decay, and a process of decomposition. The decay of the dentine is more a process of decomposition, while the decay of the enamel is simply a dissolving out of the substance between the enamel rods, and the enamel rods falling together. A bicuspid comes in contact with its fellow in a limited area, and the intensity of decay is at one point, and the extension of that cavity would be less than the extension in another cavity. Why? Because the intensity of decay is located at the smaller point. The old idea that in making cavity preparation every cavity should be extended two-thirds of the width of the tooth, bucco-lingually, is wrong. That is not the basis of extension. We want to extend to immune territories, and what are they? They are territories that do not decay; first, because they are protected by the gum or friction. Decay does not take place on the surface made clean by mastication. If the tooth is of a different form, you will have the point of contact at a different place. When there is more tooth contact, a great area of contact, we have to make a larger extension of the cavity, because the points of proximal contact are broader than in the original case. Let us lay down this rule and stick to it: extension in relation to the amount of proximal contact.

There is no use in cutting tooth structure away when it is not necessary. We do not consider enough the relation of an individual tooth with its fellow. You cannot consider the tooth by itself and not in relation to its fellow. If you do, you can not get the right amount of extension in preparation. I deplore the fact that so many dentists are losing their manipulative ability. They are depending on engines and all sorts of things, and have lost the ability to use hand instruments. The old fellows who made their excavations and filled the teeth entirely with hand instruments possessed wonderful manipulative skill; but I fear this is passing away. We must have no enamel structure unsupported by dentine. That is the basis of cavity preparation, and for this purpose I want to encourage the use of chisels instead of burs. The first thing we grab hold of is a bur. Much unnecessary pain is produced by the indiscriminate use of the bur. We use a round bur, and produce what? Friction and heat and pain. It is the needless pain of which I am speaking. It is easy to clean out a cavity if excavators are used skilfully; whole decay can be thrown out if the enamel has been cut away sufficiently. Cut away the unsupported enamel, and then with your excavators it can be done wonderfully quick. Another basic principle in cavity preparation: of course, we know that many of the old operators who did not have cavity preparation down, as we call it, did many things that I do not believe the modern man should do. One was to build his house on a foundation of sand or a toboggan-slide. No matter what form of cavity you have, it should have a flat floor. Every filling should rest on a square base. The filling of a tooth on a round base is not logical. The cavity should have a flat floor. If we find it goes too deep, we have methods and remedies whereby we can take care of that. The principle is that a filling should rest on a square foundation. If the foundation is flat, there is less danger of dislodgment of the filling. These cavities should have a flat floor and a square wall. I want to warn you about the use of the various substances put upon the market as cavity linings. If you want a cavity lining, a substantial one, there are only two materials you should consider. One is the old oxychloride of zinc, and the other is the oxyphosphate. Gutta percha is unsuitable as a cavity lining, for when heat is applied it expands, and the filling is forced out. You get various troubles from the use of gutta percha. Some times you will have a pit cavity and a fissure cavity, and the pit cavity will unite with fissure under a bridge of enamel. If that enamel is sometimes left, it almost always makes the filling only a temporary one. Unless we cut away all the enamel unsupported by healthy dentine, it is only a matter of time when failure takes place. As a general proposition, if the cavity does not receive the proper amount of attention, it is only a matter of time until failure takes place.

As I grow older I have less and less use for amalgam, on account of its instability. When the filling has been in the mouth for some time, you have noticed a cracking away at the edge of the filling, leaving a place that looks as though there had been shrinking of the amalgam, and in many instances there is a breaking off of the enamel rods or the amalgam edge. If we use gold, we can cover a larger bevel on the cavo-surface, because we have the protection of gold, on account of its greater edge strength.

The cavo-surface angle should be beveled back a little, but less with amalgam than gold. With combined pit and fissure cavities in molars, sometimes the filling in the fissure is made separate from the filling in the pit. Where the decay has extended to any degree, there is a connection between the decay in the fissure and the decay in the pit, and if the enamel bridge is not removed, you will find it only a short time until the enamel rods break down and we have failure. Frequently the operator is deceived, because he doesn't feel any softening of the dentine between the two cavities, but unless there is a large area of perfectly normal dentine between the two cavities, the occlusal area should be removed and the filling made. The old school simply extended the cavity to where the decay stopped. It is astonishing to see how long those fillings have stayed in place. In Texas some years ago, a dentist who had been practicing fifteen years was giving a clinic on cavity preparation opposed to extension, and he brought a number of fillings that had been in from fifteen to twenty years where no extension had been made, and there was no redecay as clinical evidence that extension was wrong. Why is it they last so long? Simply because the patient passed into a state of immunity. I have been watching a cavity in a molar in my own mouth, out of which the filling came eight or ten years ago, and there has been no decay. Why? Because I am living in a period of immunity. Watch it closely in your patients over twenty-five years. Immunity will take place at twenty-five or maybe a little later.

Decay will be active, they will then pass into a state of immunity. Dr. Black says he has passed into two or three stages of immunity and susceptibility. Whenever an immune patient becomes susceptible, watch out for the nervous system. You will find an extremely nervous condition and an over-worked man. It is a warning, and in some instances I have sent some of my patients out of town for a vacation just as their physicians would, when I find decay becoming very active after a period of immunity. I believe the dentist is the best judge of the first symptoms of a nervous breakdown. I do not believe it, I know it; because it will nearly always show in the teeth before anywhere else. One man came into my office, the president of one of the largest corporations in Atlanta, and I saw general susceptibility to decay. I said, "Leave town." He said, "Why?" "You are on the verge of a nervous breakdown." And he said, "No one knows that, not even my wife, but I know it." He took my advice and left town. I filled the necessary cavity; he left town, and when he came back after a month's vacation he had built up an immunity again. And so the dentist should be the first man to recognize a great many diseases to which the flesh is heir. If a man is observant he can do this. I can very often diagnose intestinal toxemia. We must extend our cavities lingually in accordance with the amount of proximal contact; we must extend in accordance with the amount of proximal contact buccally.

The next thing in the extension is that it should extend under the free margin of the gum, because the gum passing over the base of the filling absolutely prevents redecay. We have found this out by experiment. The question sometimes comes up: suppose the gum has receded, do you cut under the gum? No. The proposition then is different. You have a pathological condition of the tissues of the mouth, a recession, and various other things. If we extend into the cementum, we invite decay. Some people have the idea that to extend under the gum we must cut the enamel clear to the juncture of the enamel and the cement. It is astonishing how far the gum in the proximal surface laps up on the enamel, and you will find it unnecessary to cut away all the enamel, but much of the enamel is left at the base of the wall. One point in filling teeth we must undertsand perhaps more than any other, and that is, what is proximal contact? and where should it be placed? The idea prevails that proximal contact should always be in the center of the teeth, measuring them bucco-lingually. Just as soon as you put it in the center you will have an irritation of the gum on the buccal side. The teeth are so arranged in the mouth that the pressure of food substances must not come in violent contact with the septal tissues, the tissues fill up the proximal area. The point of proximal contact never goes beyond the center, lingually. We must have dentine on which the enamel can rest; unless we do, the enamel loses its strength and the rods fall out and we get redecay. Never groove the floor in your cavity preparation. Why? What advantage do we obtain? You do not keep the filling from slipping out. The filling will not come out. By grooving we weaken the wall, so that in a short time the strain of mastication breaks the enamel rods and we have redecay.

A MEMBER: Wouldn't that depend on the depth of your groove?

DR. HINMAN: Yes, but a shallow groove would be of no advantage. I do not think there would be any additional resistance to stress at the occlusal surface with a groove in the floor.

A PERMANENT ROOT CANAL FILLING WITHOUT GUTTA PERCHA POINTS

BY DR. H. L. MEAD, RAPID RIVER, MICH.

The method I have followed during the past three years in making permanent fillings in root canals has proved successful in the 450 to 500 cases in which I have used it. It may be interesting to others in the profession, as it is original with me. In devitalizing and removing the tooth pulps I follow out Buckley's course as taught us at school.

When I am sure that the nerve is completely devitalized or anesthetized, I open up the pulp chamber with a small round bur—No. ½ or No. 1—to be sure that the pulp is dead. Then with a round bur, size 11 if a molar, and 6 or 7 if a bicuspid or an anterior tooth, I open up the pulp chamber, to give good access. At the same time I obliterate all pulp tissue from the cavity, washing the cavity out with cold water.

Now I adjust the rubber dam if possible, dry out the pulp chamber, and clean the entire tooth of all debris before attempting to remove the pulp. When the tooth is as clean as it can possibly be made, inside and out, I remove the nerves with a fine, sterile, new broach.

I wish especially to emphasize the point that I never use the same broach on two patients. It has been my experience that a fine broach carefully worked down the side of the canal becomes entangled with the nerve and facilitates the removal of the nerve with less pain, if indeed there is any pain at all.

After complete removal of the nerves I wash out all the blood I can from the canals by wrapping cotton on the broach and wetting it with cold water, and with this I have no trouble in getting the canals very clean. This thorough cleansing of the canals I consider the one essential step in successful root canal filling. I use cotton on a smooth broach and get as much moisture from the canals as possible. This I follow by dehydrating pulp chamber with absolute alcohol, and then I use J. & J. absorbent points in the canals until the points come out perfectly dry.

The canals are now ready for filling. The first step is to moisten the canals with oxpara liquid. Then I mix up a medium paste of oxpara and with a smooth broach I pump the paste into each canal. In the case of molars I fill the smallest canal first. After pumping the canal full of this paste I wrap a few shreds of *non-absorbent* cotton on the end of the smooth broach and use it as a plunger, forcing it up the canal until I get a response, after which I carefully withdraw the broach, leaving the cotton in the canal. Dr. Dodez kindly suggested this step to me, as one that he has successfully used for forcing the paste to the apex for the past 14 years.

After all the canals have been filled as completely as possible, I seal the oxpara in with cement and place in the filling. The only cases in which I use a gutta percha point are those in which I am going to place a dowel in the root, necessitating a more solid root canal filling. As previously stated, I have used this method successfully for several years, without a "come-back," and from careful inquiry of other dentists in this county, I understand that none of my cases have ever come to them. It has been my custom to make a special point of asking all my patients, when they return after a period of four to six months, if the teeth whose root canals I filled have been comfortable, and I have yet to hear of a tooth that has given any discomfort.

Another point about oxpara is that in addition to being an excellent root canal filling, it is a most satisfactory mummifier. You can rest assured that if any nerve filament is left in the canal, oxpara will take care of it nicely, and no more trouble need be anticipated.

Just one more practical hint—a little idea that I use and have never seen published in any of the dental journals. I find the jiffy tubes very handy when sealing in treatments in upper teeth with calxine. Fill the tube with cement and squeeze the cement into the cavity just where you want it.

I believe that the foregoing covers the main features of my method and that satisfactory results will follow wherever this plan is carried out.

TEN YEARS WITH ASCHER'S ENAMEL

C. E. DUCK, D.D.S., BALTIMORE, MD.

The avidity with which the dental profession availed themselves of the opportunity to test Ascher's Enamel was highly significant. There was a crying want for such a material and for some reason dentists had confidence in it. The preparation advertised itself by its merit, as there was very little money spent in the journals; so that I failed to see a single advertisement.

My attention first was called to Ascher's Enamel by seeing what I supposed was a remarkably beautiful porcelain inlay, but when informed by the patient that it was a new porcelain cement, put in by a dentist in Philadelphia, immediately I went there and interviewed many prominent dentists who had seen it abroad and were using it daily, with entire satisfaction. Since that time, nearly ten years ago, I have been using Ascher's Enamel almost to the exclusion of all other filling materials, and I find no cause to regret my choice. I have had some failures, which, in most instances, I believe were caused by some fault of mine, although it is possible that carelessness of some employee produced defective materials.

I built an entire central incisor around a screw-post, and its good condition easily might lead one to think it was a pivot-tooth. In all cases where it is either too difficult or too costly to remove a bridge, I replace broken facings with Ascher's Enamel.

I have tested every imitation of Ascher's Enamel that has been placed on the market and find none of them durable, as the average life of the best has not exceeded eighteen months.

When an operator has almost invariable success with a filling material, he is liable to take a liberty now and then, such as not using the rubber dam or removing it too soon. I plead guilty myself, and have in most cases regretted such laxity, because extreme cleanliness and all other precautions suggested by the manufacturers are absolutely necessary to attain perfect results. I am fully convinced that, up to the present time, there is no other filling material that can compare with Ascher's Enamel for artistic effect, durability and wide sphere of usefulness.

UP-TO-DATE METHODS OF OFFICE PRACTICE*

BY DR. THOS. P. HINMAN, ATLANTA, GEORGIA

SHOW ME THE DENTAL OFFICE and I will show you the dentist. I do not have to look except into his office to tell you what kind of a dentist works there. I know him, and the public knows him. The perception of the public is very keen, and the little things that make up the great whole are the things that count. You cannot neglect little things and expect to be successful.

Many have attempted to reach the pinnacle of success, and have gotten only a part of the way and have become self-satisfied. That is one of the most fatal errors that can be made by a man—becoming self-satisfied. It reminds me of the story of the man who was shooting at the moon. His friend said, "It is impossible to hit the moon." He said, "I know that, but I can aim high."

The one thing I wish to impress upon you is to aim high. It is impossible to stand still. We either advance or retrograde, in methods, in technic, in the conduct of our practice. It doesn't mean we must have all the appliances put upon the market for the purpose of making our office look up-to-date. Many of these appliances we use are hidden and not seen by the casual observer. One of the greatest things in the practice of our profession is summed up in one word, and that word is "Efficiency." There are men trained, experts, who receive large emoluments, salaries of $10,000, $15,000 and $20,000 a year because they are efficiency engineers. They take large businesses and find where the work is slack. They find in the production of a certain article, or in the movement of a ton of iron from one point to another, it takes so many movements of the body to accomplish it. These engineers analyze the number of motions it takes to produce a certain article. They sometimes take a moving picture of the man who is doing this particular operation, and then find out how many movements they can eliminate. And the efficiency in some institutions where modern methods were supposed to have been in practice has increased fifty per cent.

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*A talk before the Kentucky State Dental Society, 1914; one of a symposium of talks on this subject.

Are we efficient in our work? Does every movement of my hand and body co-ordinate and accomplish something every time? It does not mean we must have a large equipment, but, with what we have, are we most efficient? I remember going into the office of one of the most prominent practitioners in New York City. He said, "Come in and let me show you my new cabinet." It was a great, big oak sideboard, and instead of having large drawers, he had a number of small drawers, and in them it seemed to me he had a thousand instruments. It would take two assistants all day to keep them clean. I do not call that efficiency. Efficiency is taking one instrument and accomplishing the most that can be accomplished with that instrument, without changing it. That is efficiency. It must be understood that the selection of the particular instrument to accomplish the work must be carefully done. Now, are you selecting that instrument?

In the arrangement of the modern office we must have things systematically arranged. I have no particular set of instruments I wish to bring before you. but I wish to impress upon you the necessity of being able to accomplish with a few instruments successful results.

One of the greatest factors that brought American dentistry to the forefront and made the American dentist the standard of the world was his manipulative ability, the skill with which he worked. I fear we have fallen away and lost much of the cunning of the older men. We are dependent too much on the things made ready for us, and I believe in those things, but not in putting too much dependence in them.

Every dental practice must be arranged according to its requirements, and the requirements good for you might not be efficient in my practice. The one aim and object with me is accomplishment, efficiency grounded on system. You cannot expect to accomplish work rapidly and thoroughly unless you have a system for handling all of your work. In the arrangement of the office, my ideas may not coincide with yours, but there should be no confusion in instruments. Take excavators, and you have a drawer full, and they should be in order. Suppose you have an assistant not intelligent enough to know how to place them. You can mark them by placing them in correct position; then lay a rule crosswise and make a notch in the handle of each instrument. When they are in correct position the notches will make a diagonal line. This solves the problem. If each instrument is not in the right place, the line will be broken. This saves a great deal of time.

I believe in every well regulated dental office you should have a good lady assistant. They are very difficult to get, require careful training, and are part of your efficiency. I had a patient, nearly eighty years old, come into my office; a hale, hearty, strong man, who had been successful in his calling, and I said, "How is it you have retained your physical and mental vigor to this time?" He said, "I learned early in life that if I wished to accomplish anything and do it well, I should never do anything I could get anyone to do for me, provided they did it well." I do not believe any dental office is complete without an assistant. You can accomplish so much more in a day's work. Sometimes I work from eight in the morning until one in the afternoon without so much as speaking to my assistant. If she sees me preparing a cavity to make an inlay, she makes her preparations for the exact time I will need to take the impression. When she sees I am ready to put a rubber dam in place, all I do is to put the clamp on, and slip the dam over it, and she puts on the holders and everything is ready for me to go to work. That is efficiency. The time I consume is thus minimized. The same thing is true in the use of cement. She has become so expert in cement that she can mix it better than I can. She mixes amalgam better or as well as I can, and not only is the amalgam mixed, but it is placed on a napkin on the operating table with all the instruments used for amalgam work. That is efficiency.

In the modern dental office there are many things that I think are not true on their face. One is the cabinet having "Sterilizer" on it. I wonder if we went in there how many cultures of bacteria we could find. If it were on mine I would rub it out. If you want sterilization, it can be readily accomplished by a drug known as Lysol. Lysol, in a three-per-cent. solution, will not rust steel. For instance, all clamps, separators, broaches, lancets are kept in the Lysol solution all the time. They are never out of it; they are always ready for use, sterile, on a second's notice. If you will come to Atlanta you will find a latch string on the outside and a hearty handshake on the inside, because my office is always open to my friends. I will be glad to show you lancets, separators and clamps that have been in a Lysol solution for fifteen years, except when taken out for use.

Serious infections have come some times from the placing of an infected clamp around a tooth, and these infections have caused marginal troubles that have resulted sometimes seriously. With separators, the same. Before being put in the Lysol solution they are shined with sapolio. I may be extreme in this respect, but I am sincere.

I think the dentist in the operating room should dress in white, from head to foot. Coats should be made specially, with no pocket on the left side, because it sometimes catches on the chair. It should be a military coat, close up and buttoned over the collar, so the tie is not exposed. This is a regular part of the office equipment, to be dressed in white. My assistant is dressed in white. Every patient that comes in has a special apron put on, and that goes down well over the dress so as not to damage her clothes by the dropping of medicines, which sometimes is unavoidable. My assistant makes all the napkins, and the curtains for the windows, and makes her own aprons. Part of the equipment of my office is a sewing machine run by electricity. I think that is necessary for the conduct of my practice.

There is one thing in which the average dentist is lax, and that is in taking care of his income. His outgo will take care of itself. How many operations did you fail to charge last week? Can any of you say, "I didn't fail to charge one?" Some of you have not; I should say, about four per cent. Now why is this neglect? For the simple reason you have no system about it. System is easily established, and I use what I call the "instantaneous charge" system. I have special blanks printed, with the name and address, and of course cuts of the upper and lower sets of teeth, and then a little arrangement for so many operations, for instance, gold inlay, porcelain inlay, synthetic filling, cement filling, amalgam, and so on, and when the operation is completed and my assistant is making the chair ready for another patient, I make that charge. If you do not make your charge until later, you forget the difficulty of the work you do, and you are cheating yourself. My books are audited twice a year, just like those of any corporation. By this system I am able to know positively that my books are correct. Every month a trial balance is taken off and every item is charged in the proper way, and I know every dollar collected, every dollar put on the books and every dollar spent, and what it was for, and I know just what I have made. In this way I can regulate my habits; I know whether I can afford this or that. Half the people in Georgia and Kentucky are bankrupt and don't know it. I am able to refer back at any time to any operation in triplicate, to the original charge in duplicate, the ledger being a loose-leaf one. Every account not paid by the 15th of the month is put before me by my bookkeeper, and I look them all over and keep up with them.

One of the faults of the dental profession is that we send our bills out sometimes when we want money. Every account of every description in my office is sent out the first of every month. Suppose a patient comes in on the 27th of the month; he receives a bill on the first of the month, up to the 29th, but operations from the 29th up to the first are always charged in the next month. What is the consequence? Instead of having a flush time and a lean time, it runs along evenly, and I know every month my income will be approximately so much. What is the consequence of the training of my patients in that way? The result is that practically every account on my books is collected in ninety days, and when I find it is beyond ninety days I begin to get very uneasy.

There is no reason why you should not apply this method. There is no reason why the professional man should suffer any more than the grocer or dry goods man. Just apply common sense. Let your patients understand that the bills are to be sent in, and that you expect them to be paid promptly, and I believe you will find that it will work out successfully. The dentist should receive what is due him; he doesn't, for the reason he doesn't send his bills promptly and insist on payment. He does not apply the principles of business to the conduct of the business side of his practice.

This method will keep you in your old age from dying a pauper. When I first began to practice, two of the members of my profession died practically paupers, and I said, "Have I entered a profession that will not give me the comforts of life? If it is such a profession it is not one I want to practice." And so many have gone through that same thing from their own careless way of handling their business, and I want to impress upon you the necessity of accurate, positive, regular bookkeeping, and the insistence on the payment of your accounts promptly, as promptly as those whom you owe insist upon your paying.

UP-TO-DATE METHODS OF OFFICE PRACTICE*

BY GORDON L. BURKE, D.D.S., OWENSBORO, KY.

FOR THE VILLAGE DENTIST to meet the requirements of an up-to-date practice in its entirety is hardly to be expected; for this same man to undertake to contribute much worth while to an audience of Kentucky practitioners is a thing which must be charged to your executive committee.

Then your pardon in my behalf is asked because of my desire, more than the fulfillment, to lend something to the success of the meeting.

An up-to-date practice, from my viewpoint, persisted in for any appreciable length of time, other things being equal, must mean a successful one.

It is this successful issue, besides our own comfort, conscience, peace of mind and best service rendered, that spurs us on to up-to-date methods.

It is for these up-to-date methods of office practice, these matters of interest and learning for our enlarged sphere of usefulness in our humanitarian work, for our social welfare and financial benefit that we come to these meetings.

If an up-to-date practice, and a successful one, are one and the same thing, let us consider some of the contributing elements.

While the financial aspect is not to be lost to view and realization, its achievement alone, regardless of the best service rendered, should not be the accepted up-to-date practice. Then it must follow that those things that contribute the greatest comfort, the greatest service, the longest life and health to the mouth and its contents, a service rendered in a humanitarian and a hygienic way for a compensation adequate for our present needs and a competency for old age, should be the accepted up-to-date practice.

While we are striving for the ideal, we shouldn't forget that dentistry is a nerve-racking and exhaustive work, that charity begins at home, that we must conserve our strength and be fully compensated. Of course, no practice however large and remunerative, can be worth the cost of our health.

*One of a symposium of papers read at Kentucky State Dental Society, 1914.

I think we should give thanks to the *Dental Digest* for its timely and valuable advice about our financial betterment. It has doubtless stimulated many men to work harder to render more efficient service and given them the courage to ask a more reasonable fee for it.

There is nothing so depressing as an under-paid service. It takes no little courage to learn to do and do our work in the accepted manner without adequate compensation. So much for these generalities.

Granted a man is endowed with some literary attainment, a good dental education, is clean, honest and respectable, he is ready to launch himself upon the sea of life and endeavor for an up-to-date and successful practice.

In a small community he will not often go wrong in locating near the post office in a well-lighted, well-ventilated and nicely-kept building.

Located, everything must be clean and inviting, and, if possible, some pretension shown in the furnishings, as people like to patronize a successful business. Whenever possible, a maid should be employed. The office should be freed from any objectionable odor of medicine, whiskey and tobacco. The last named is particularly offensive to some of your sensitive and exacting patients.

Of course, the dentist himself should be immaculate from head to foot, his linen and doilies should be spotless, his instruments sterile, his demeanor quiet and reassuring.

Before an examination and after work, I like to spray the mouth with some warm and pleasing antiseptic. In examinations, to take in the whole situation, that is, to see the needs of the teeth and the entire mouth. If you recognize adenoids, diseased tonsils, epulis, ranuld pyorrhea, syphilis, chronic abscess, cleft and other troubles and do not practice their cure, it is your duty to send them where they can get relief. So it should be with anything that can add to the comfort and longer life of the patient. We should familiarize ourselves with at least the most common troubles in the mouth.

Some of our profession are prone to look no further than the teeth. Indeed, I have had very desirable patients to come from other dentists, dismissed, and found exposed pulps in the centrals. We cannot be too careful in searching for trouble.

I have experienced pleasure a number of times in being able to send the afflicted to those whom I knew could render a helpful service. This was done when other men had neglected that opportunity. Of course these things count; they invite confidence and are business assets. Of course, in the short time allotted to a paper of this kind, it will have to be treated in the most superficial way.

I believe one of the most important things we are called upon to do and often one of the greatest neglected, is that of cleaning the teeth. It is the concensus of opinion that the failure to do this causes perhaps the greatest loss of teeth. With the exception of the specialists, all of us are called upon for this duty. Some of the most discriminating like to call this procedure prophylaxis and to that I am perfectly agreeable if they give it increased efficiency. What excuse, what hope is there for the dentist who throws his hands into the air, at the same time exclaiming there is no relief for pyorrhea? Perhaps he is right about his inability to treat it. Then, in the name of comfort, health and longer-lived teeth, send them to the man who claims to give, at least a measure of, relief. If he doesn't live in your town, send him to some other man's town. If you have studied the conditions and tried intelligently and skillfully with well adapted instruments, you have surely met with some encouragement. These treatments should be followed with prophylactic advice and warning to return at stated intervals for examination and further treatments to prevent the recurrence of the trouble. Isn't it far better to lessen the trouble, to make longer-lived teeth, than to despair and lend not the least encouragement?

The greatest amount of the dentists' time is probably spent in filling teeth. How it should best be done, and the best materials to be used is generally easily decided. While there is not, perhaps, the remotest doubt but what gold is king of all filling materials, when properly manipulated, for longevity of service, yet there is a growing tendency to do less of it in the anterior teeth. The golden age is passing and is being supplanted by the exceptional few who have acquired great skill in porcelain work and by the great majority who are using the silicate cements. Of course, the durability of the latter may yet have to be proven, but sufficient is already known for me to predict for it a wider range of usefulness with the increased perfection of manufacturing and clinical experience. I refer especially to Synthetic porcelain, with which I am working with gratifying results. I believe I perfected more than the average manipulative ability with the cohesive foils, but when I think of the exhaustive work required, I believe its first place is surely weakening in the esteem of dentists.

I do not know what the status of the white copper cement will be or how it is even now generally regarded. Gutta-percha finds little use in my practice as a permanent filling. Good and long service have rewarded my efforts with alloy, gold, both as a filling and inlay, and satisfactory results thus far observed with Synthetic porcelain. The oxyphosphates are rarely used in my practice, except for the most temporary work, intermediate fillings, and the cementing processes.

To my mind, one of the most comforting things we do in the mouth is the restoration of the contact point. All of you see daily fillings that are not restoring the natural contour and contact. Too many are satisfied with simply plugging the teeth, with no idea nor attempt being made to protect the gum pedicle or interproximal tissue. This can be done to a degree with all of the filling materials, but to my mind, gold measures up to the highest standard of efficiency. This is one of the best services to which the gold inlay can be put. When lacking its full contour interproximally, its deficiency can easily be supplied by tacking on a little solder.

There are surely no longer dentists in our commonwealth who are not availing themselves of this great boon and benefit. If so, they are denying their patients a great and lasting good. Of course this is no careless man's work. It requires no little pains to get the maximum result.

A tooth is no stronger than its foundation, and this is so often overcome and broken down by faulty contacts. Some of the best workers and thinkers now believe it is splendid practice to cut into absolutely sound teeth in order to bridge over by the inlaying process or otherwise for the protection of the gum pedicle and peridental membrane.

A slight imperfection in the fit of your inlay at the gingival margin, due to shrinkage when you can't get good access, can be overcome nicely by putting some soft alloy in that portion of the cavity just before the cementing process. If 23k. gold is used, any other inequalities may be burnished and malleted out. With these methods and the Black cavity preparation, results can be obtained that are not possible with other metals and methods.

I believe any man who has heeded that advice, "Observe, compare, reflect, record," that is always staring you in the face when you pick up your *Cosmos*, will no longer doubt the wisdom of the theory of extension for prevention. It is a winner and enables you to get the most lasting results.

Probably the things done in our work that consume the most time after prophylaxis and filling is the restoration of the lost organs by means of crown and bridge work. I shall not attempt to go into the construction of crowns. That has been so ably done and will be a feature of the post-graduate course of the meeting. I should like to emphasize the point, brought out by Dr. Goslee, last May, and that is of learning to do very well a few of the better crowning methods, than to do a great variety of them poorly.

It occurs to me in doing this restoration work that it all, as far as possible, should be done in replaceable teeth, like the Goslee, Evslin and Steele make of teeth. Of course, our records should show the makes, mold and shade to take care of trouble most readily when it does come.

There are a few things about crown work that I should condemn, namely, the placing of a gold crown on the anterior teeth when possible to avoid it, and the unhygienic space left between the root end and such crowns as the Logan, Davis, and other similar crowns when the cementing substance has dissolved out. This should be eliminated by closer adaptation in one of the many ways.

There is a recognized difference in favor of porcelain as a grinding surface, and of course when indicated, should be used. In all work, whether it be operative, crown and bridge or plate, the greatest nicety of finish must be given that the greatest hygienic feature may be enjoyed.

A shell crown is probably one of the most abused restorative processes in the mouth. Look well to your tooth preparation. I find I can prepare very few of them unless the tooth is especially favorably shaped, without previous pulp removal and root filling. Unless this is done, the nitrate of silver coating before setting of crown should be used to reduce the sensitiveness caused by the phosphoric acid.

Besides the great advantage derived from the more natural appearing replaceable teeth in crown and bridge work, and the added efficiency on account of the porcelain grinding surface, we are getting better results with these fixtures on account of such attachments as the Roach, Morgan and Gilmore.

The iridio-platinum root implantation, as now being taught, offers a field of usefulness that perhaps few of us have thought possible. While some of the methods are comparatively new, it yet remains to be seen how practical they may really prove to be. I believe they will come into favor in certain selected cases.

With the newer anatomical molds of plate teeth and all that is being taught and learned concerning anatomical articulation by the Gysi methods and others, we are enabled to serve our patients with edentulous mouths, as never before.

Since these various things are being successfully done, what are we doing to lessen the burden of pain inflicted?

For the filling process alone, little is needed, as we do not tax the system as formerly. I have read of the older operators feeding patients brandy through tubes to prevent exhaustion, in some of the large gold operations. Thanks to the gold inlay, much of that is eliminated. For cavity preparation, sharp instruments, pressure anesthesia, dehydration, phenol, analgesia with gas, water from a syringe—all are used. While gas and oxygen may be indicated in exceptional cases for cavity preparation, I have been unable to convince myself that it should be the general practice. Hewett and other anesthetists tell us, however, that the combination of gases properly given, even in seemingly contraindicated cases, are practically harmless. Perhaps by and by increased simplification of apparatus and its administration, we may all give it with the greatest impunity. Pressure anesthesia where indicated is probably the best method of pulp removal.

Novocain should replace cocain as a local anesthetic because of its great value and efficiency and lessened toxic effect.

I have been unable to convince myself of the feasibility and sound judgment of prescribing unknown to the patient even an opiate in some of its forms before operating. We know, and some of us have seen, great shock from long drawn-out operations. Is it wise, then, to resort to these measures in specially selected cases?

What a blessing it would prove to patients and dentist to operate painlessly. What lasting and beautiful operations would be done. It is, of course, our endeavor to be thorough and at the same time humane. Just as soon as the thoroughness and painless dentistry are combined, an increased business, increased fees and better collections will be appreciably noted. This is what we want.

Of course, in achieving the best results in our work, radiography must not be lost sight of among the best diagnostic aids.

I thank you for your indulgence in listening to a paper containing nothing startlingly new and that without any "intellectual chloroform."

METHODS OF AN UP-TO-DATE OFFICE PRACTICE*

BY DR. E. T. BARR, BOWLING GREEN, KY.

AND NOW ABOUT this speech on "Methods of an Up-to-date Office Practice." I am *overpowered* at the thought, as I have no conception of how to approach such a subject without first being either sterilized or anesthetized or boiled up like a baby's nursing bottle.

I wish I could control my little wad of gray matter long enough to send out a few scintillations, but it isn't in me, and when I try the hardest, I am then of all times the most stupid. In fact, I sometimes think I don't know a bicuspid from a "cussid biped." And I fear I shall be as prosaic as the multiplication table, and *just* as monotonous as a droning bumble bee.

I have a mental photo of an up-to-date office practice, of an immaculate and smiling dentist, with a row of perfectly good teeth and a white linen coat, standing on a white-tiled floor, with glass shelves and shining instruments of torture, and other methods of crucifixion within easy reach. A shrieking female "coming through the rye" after a somnoform dream of airships, and a "Mr. Stormfield's visit to heaven." In fact, I see no germs or other belligerents on the field of battle to even make things interesting. But the moving picture play lacks action, and is certainly not up-to-date, unless this shrieking female is in evidence, for dental instruments without the victim are as useless as wasted moonlight on an old couple.

It's a shame to take the money when the moon is full, unless there are a bunch of lovers somewhere in the vicinity.

Among the maxims and observations of Solomon, in the Book of Wisdom which we call Proverbs, it is said that "Confidence in an *unfaithful* man, in time of trouble, is like a broken tooth."

The *trouble*, referred to by old King Solomon, may have to be a *little twisted* to suit the needs of this *hour*. But the *trouble* is here, gentlemen, I assure you, and it rests, an Atlas pose, upon my drooping shoulders.

But rather than lose the confidence you have reposed in me on this occasion, by proving *unfaithful* or being likened to a *broken tooth*, before a body of up-to-date dentists of so glorious a commonwealth as Kentucky, I am here with the goods, though the quality may not be up to your standard.

Years and years ago, 200 of them, I think, John Wesley said that "Cleanliness is indeed next to Godliness," and while the world has rolled on in a steady progress towards perfection and changed in an amazing way its manner of living, yet still as a foundation stone we can use this truism. "Cleanliness is next to Godliness;" especially so in the making and conducting of a successful practice in medicine and dentistry. Almost the first thing taught to children nowadays is the danger of germs, the avoidance of dirt, the nature of filth diseases, the necessity for cleanness in living.

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*One of a symposium of papers read before the Kentucky State Dental Society, 1914.

Of course a man must have knowledge and skill, first of all, but this avails little in the present day unless it has its proper setting, and the very fact of the knowledge brings the latter.

An office ought to be bright and cheerful, if possible, as most of your patients regard it as a torture chamber at best—a place to avoid, on the principle of "better bear the ills we have than fly to others we know not of." A doctor who allows his surroundings to grow shabby and out of date might just as well retire, for there is always an eager, anxious crowd of confident young ones ready to step in and take the place of the back numbers.

The modern aids of electricity, gas and running water have revolutionized the manner of operation. We have no excuse for imperfection in work as far as equipment is concerned, and if it were possible to raise the standard and make every man a really skilled operator, we would as a class be the greatest benefactors known to mankind, for we know that many of the ills that flesh is heir to have their origin in unclean diseased mouths. I never could understand why the good Lord didn't make our teeth like our hair and nails, to grow out again; although, as I look around, it seems he has neglected some of you in this respect; but I guess He had to make a place for all of us in the economy of nature and give us something to do.

My idea of methods of an up-to-date office practice consists, first, in having a perfectly equipped office. I mean by that to have electric engines, electric fans, electric lighting for the mouth, chair and office; fountain spittoon, the best make of dental chairs and cabinets.

Then you should have first-class instruments of all kinds. Not too many, but study the instruments you can work with most skillfully and with least pain.

You should learn to be rapid in your work, but do not slight it. I find it takes a long time to do rapid, skillful work, and it is impossible to learn it quickly. It must come with years of hard study and practice. You will find that your patients do not like long sittings. They prefer to come oftener than to have many hours in the chair. To be an up-to-date dentist you should always be polite and attentive to all your patients. It doesn't matter how busy you are, if they are suffering, always, as soon as you can, stop and relieve them. Never allow a patient to leave your office when in pain. Impress upon them the importance of keeping their engagements; teach them to be prompt—then you must be just as prompt yourself.

You should be able to keep a perfect set of books. I have a record of every piece of work I ever have done, and, do you know, that I have found it a money saver, especially when some one comes in and tells you that the filling you put in has dropped out. Your record will tell the tale every time, and closes the argument. You should be prompt with your collections. I send out statements every few months, and always get returns. I believe in good fees. Charge all your work is worth, and no more.

Try to cultivate the habit of having a pleasant expression. Learn to smile, not grin, but a perfectly natural smile. I often think of a little verse I read several years ago in an auto journal. It goes this way:

> "The thing that goes the farthest towards making life worth while,
> That costs the least and does the most, is just a pleasant smile;
> The smile that bubbles from the heart, that loves its fellowman,
> Will drive away the cloud of gloom and coax the sun again.
> It's full of worth and goodness, too, with manly kindness blent,
> It's worth a million dollars and doesn't cost a cent."

Several years ago I made a set of teeth for an old lady. She was one of those "guarantee" ladies—"I'll have 'em made if you'll guarantee 'em." Well, that is where dentists make their mistakes. I never guarantee anything I do. I always ask them if their physician guaranteed a cure of typhoid; smallpox or yellow fever. Well, this old sister never was satisfied with those teeth and sent her husband in to see me about them. I told him, to satisfy her, I'd make them over, but that she would have to come in to have the impression made of her mouth; that I could not make them over without seeing her. He was partly deaf and only understood me to say that I would not make them over, went home and told her; so she came in to see me. I'll never forget that visit. I was quite busy that day and had a number waiting in my office. Well, when that dear old sister got through telling me a few things, I felt like I used to feel after trying to whip out a hornet's, yaller jacket's or bumble bee's nest.

Going back to the seventeenth century, we find in the diary of one Rev. John Ward, vicar of *Stratford-on-Avon*, Shakespeare's home, from 1648 to 1679, the following allusion to our profession in conjunction with a royalty that exceeded even that of the Pharaohs:

"Upon a sign about Fleet Bridge this is written: 'Here live Peter de la Roch and George Goslin, both of which and *no other* are sworn operators to the Teeth of the King!'"

Whether they had any other practice than this august office of first aid to the toothache of English royalty does not appear.

But you will note, gentlemen, from the above, that *ours has always* been, from time immemorial, an *exalted* profession. *We* are *they* in whose presence *even kings* are silent, provided they are tilted at the proper angle in one of our *magic chairs* instead of on a tottering throne. And who can gainsay that *other* miracle of our profession, when *even* the *irresistible* and irrepressible voice of woman, though she be a militant suffragette, is hushed when one of our electric drills is boring an artesian well in what's left of her last wisdom tooth. Wisdom must be preserved at any cost and even a Pankhurst shuts up in such a crisis. Then they are all ready to exclaim with Walter Savage Lander: "Losing one's mind is a mere incident—one can get along without that, but losing one's teeth is a tragedy—one cannot eat! This is the end of all things."

There are many tortures in dental processes of which I might speak, but none that will equal the one I am at present enduring as I proceed to amble up to my final crucifixion. There are digressions from my subject, but it is my custom, when hunting, to always chase stray rabbits if they cross my path before a covey is in sight. These topics I have classified under the title of "Betting on a Certainty," for, with full assurance from a faithful soul, take it from me, you will never lose.

The first topic is closely allied to dentistry, though it can scarcely come under the head of modern methods. It has more to do, however, with an infallible law of the universe commonly framed up in the wise maxim that "Nature abhors a vacuum," and never fails to fill it. Did you ever watch the small boy to whom someone has promised the reward of one dollar provided he won't stick his tongue in the place from which his precious tooth has just been jerked? Did you ever compare the first ecstatic expression on that particular small boy's expectant face with the last dejected semblance of a hope that is not deferred but plainly down and out? If you haven't seen that look—well, you've missed a chapter that only Mark Twain could have done justice to, in the lives of little men. It's the first lesson in "Betting on a Certainty," and you can't lose.

But wait till you hear the rest. It has to do with a dentist, of course, and also *modern methods* in our great profession of helping Nature to pull through while we "pull," too. Of course, everybody goes abroad nowadays and trips to Europe are no longer the only things associated with mortgaged homes—automobiles having superseded such antiquated financial crises in the lives of those who "cross at any cost"—even since the horrors of the Titanic.

Now, in these latter days, it is not so much a question of "having crossed" as "how many times you've bridged the pond." But, take it from Solomon, the person does not live, who, having crossed once or a thousand times, has the moral courage or kindly consideration for those not in the least interested, to eliminate it from his or her conversation. Sooner or later with each fresh victim, the European miasma emanates from its fountain source—that infernal sight-seer—and another unfortunate looks bored.

Sometimes it is worked up to, like a bashful fellow, who wants to propose. Often it breaks loose in a good sneeze—let's everybody know it, though convincing them at the same time that it was purely accidental. And the victim murmurs, "If I have to take it, Lawd, let it be a sneeze!" and soon over.

Once in a while this European traveler gives a first-class exhibition of the hiccoughs. Then there's no stopping it unless some one hands him a glass of water and says, "pray do!"

Often, I'll admit, that the information is skillfully and adroitly handed, but—the ladle is visible none the less, and somebody's got to swallow the dose.

"When I was in Rome," or "the last time I crossed," or "it reminds me of the Alps," or "doesn't this make you think of London?" I say, can you stop it, gentlemen, or did you ever try? If you win I lose, for this is the third thing that comes within the requirements of "Betting on a Certainty." There is, therefore, no law that can deprive anyone from bodaciously dragging into conversation, bodily and full-grown, the tiresome fact that they have been abroad. It's a topic that now ranks on a dead level with the weather, and there are equally as many inane and stupid variations of the latter.

And that reminds me that I am now about to avail myself of this silent and attentive body of victims, who seem to be primed for the ordeal I am now ready to inflict upon them, namely, a minute account of the post-graduate course in dentistry I took "while in Paris" last summer.

It won't be long, I assure you, but it will be thorough so far as I can make it. To begin with, gentlemen, it was not premeditated, for I had just installed my son, a recent graduate of the Louisville Dental College, in my office as the most modern agency procurable for all advanced ideas, and certainly the epitome of all that was strictly up-to-date in office practice. This goes without saying, since you all know the reputation of such an institution, and its guarantee for turning out pretty good timber. Therefore, I didn't think, with such equipment for *modern methods* in office practice, I could be quite in line for the superannuated list. Nor did I, in my wildest flights of imagination, fancy that I needed the added impetus to skilful dental surgery, of a post-graduate course in Paris.

Frankly speaking, gentlemen, I was the victim of circumstances. My wife elected to go abroad. My daughter seconded the motion. I voted against it. In fact, I rebelled, not willing to have my life-long friends and patients shun me upon my return—lest I tell them of the trip. I had visions of Maxim Silencers being used at large by my friends to muffle my noise. I dreaded Paris like the smallpox and Rome like the black plague. I knew my asthmatic tendency would succumb to the gloom and fog of smoky London. So I mutinied, put on an aggrieved look, and—sulked. Nothing doing, gentlemen, nothing doing. My wife capitulated—holding out this alluring post-graduate course in Paris—and I, the victim of circumstances, meekly crossed the gangplank in Little Old New York.

Don't leave, gentlemen; please be seated. The fire has been extinguished—just a slight blaze and a false alarm for the hook and ladder gang.

I *shall omit the voyage* and likewise the *moonlight* on the Grand Canal—although I fished out of my window under its stimulating influence.

Go with me, then, to Paris, and imagine me, as you see me, an English-speaking and country-bred American from the quiet burg of Bowling Green—without even a Baedeker as a life preserver—lost, gentlemen, lost in the maze of gay "Paree," while my wife and daughter were spending all my money in the shops for women's clothes. I was looking for the college and I meant to enter. I did enter and likewise retired. Here is my diploma, gentlemen: a flat pocketbook and a big word called *experience* in my head.

And strange to say, gentlemen, like the two children in the "Bluebird," after a vain search in foreign countries, I have found it all on this side of the waters.

METHODS OF DENTAL OFFICE PRACTICE*

BY I. H. HARRINGTON, LOUISVILLE, KY.

It is important at the first appointment to make a record on an examination chart of the work required.

If the chart is marked so that the patient will see on the tooth forms the cavities, crowns and bridges, etc., required, it will help you and your patient to agree about the kind of work and in many cases an understanding regarding the fee for your services. If it is necessary to make an estimate of the expense, especial care should be made, indicating that it may be necessary to do more work than outlined on the chart, giving the patient the reason for this before any work is performed. By following this rule the patient will be prepared for the fee charged. It pays to have a satisfied patient.

All new patients should be given a demonstration in oral hygiene at the first sitting, also a clean-cut, five-minute talk on the care of the teeth. By so doing, much good is accomplished and your reputation is much elevated in the mind of the patient.

Reception and operating room scrupulously clean and equipped in the best paraphernalia is a large factor in impressing favorably your patient.

The dentist, by proper recreation, study and association with his fellows, will gain much in knowledge and skill in performing his work.

If a systematic card record be kept of each patient who desires to be reminded at stated times, say twice per year, and this mailing list be carefully worked in a few years, most any dentist of ordinary ability can establish as large a practice as he can take care of.

If all your time is taken by previous appointments, the undesirable can be eliminated without offense, for most of that class will not wait because they have neglected their teeth to the point that they need immediate attention. Again the busy man gains influence because he is busy.

These simple rules are not only theoretically correct, but tried and practiced.

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*One of a symposium of papers read at Kentucky State Dental Society, 1914.

DETAILED PROCEDURE IN PULP CANAL OPERATIONS*

BY DR. ELMER S. BEST OF MINNEAPOLIS, MINN.

Our time is so limited that I shall attempt simply to mention the essential features in this operation.

We must, whenever we possibly can, operate with the protection of the rubber dam. This is to be applied with a rubber dam holder, which has interchangeable parts, allowing a new and clean holder for each patient or one which is all metal and can be sterilized. The dam in place, freely open up the cavity, (we will now assume that we are operating upon a tooth that has either had the pulp devitalized or anesthetized) get good access to the orifices of the canal.

Now we will describe the manner of handling these fine canals, where in the past we had said, "Fill them as best we can and let them go." The unfortunate part of it is that the results of such operations have been "going on" for a long time unknown to us or the patient.

We pass into this fine pulp canal an extremely fine smooth broach and work it gently and patiently toward the apex, with a dexterity which any operator, I believe, can acquire with practice. This broach can in a large percentage of cases be worked almost to, and in some cases actually *to* the apex of the root. Now introduce into the canal the same size of a broach converted into a file by rubbing it vigorously between two fine gold files, filing backward and forward. You file down the walls of the canals and enlarge the passage to the apex. Continue this process with different sizes of broaches, gradually increasing the size. Then commence with reamers, operated by hand, seldom by the engine. Remove the debris which has collected in the canal by means of the barbed broach, using one of a known quality.

In some cases the fine smooth broach will not enter the canal on account of a construction or a plugging up of the canal. Sulphuric acid 50% or sodium potassium will often give us valuable aid in the opening of these cases.

When the canal has been opened as far as we would usually go, place in the canals fine gold wires and through grooves cut just over openings into canals, in margin of cavity through which we are operating, bend the little wires and cut off. Seal with temporary stopping, remove rubber dam and X-ray. Re-apply the dam, remove wires from roots and put in safe place, when Radiograph is returned compare wires with the shadows of the wires in the film and see if any distortion has taken place. Now place smooth broach on film, the tip of the broach at apex of the root and where the wire curves through groove, cut in margin of cavity, place small drop of sticky wax. In the mouth this tells you the distance from the groove which is in the tooth to the end of the root and is an accurate guide, providing no distortion has taken place in getting the radiograph. In case the wires do not reach the apex, a further application of 50% sulphuric acid is often necessary, followed by reamers.

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*Clinic at Indiana State Dental Society, 1914.

When the canals are opened to the apex, thoroughly remove all debris and moisten with acetone and thymol. Remove again with some absorbent material, not with an air syringe. Then lubricate the walls with liquid paraffin and introduce a rod of high-fusing paraffin and bismuth trioxid. Then using just enough heat in the electric canal dryer to melt the wax, flow it to the apex and fill the canal about three-fourths full. The balance of canal is used for oxychloride of zinc cement, which seals the canal.

REPORT ON DENTAL HYGIENE AND ORAL PROPHYLAXIS*

BY DR. J. D. LOCKE, CHAIRMAN OF COMMITTEE

IN LOOKING OVER THE ISSUES OF The Dental Summary for the past two or three years, I find that the work of oral hygiene and dental education in the state of Michigan has been taken up pretty thoroughly by Dr. G. C. Bowles, and therefore anything I might furnish you in the way of a report would be practically a repetition of what has been said before, and since Dr. W. A. White, who is engaged by the New York Board of Health to lecture to the children in the public schools of that state and whose work is so highly endorsed by the superintendents of the different schools, is to appear before our society tomorrow evening and tell us what is being accomplished in New York along these lines, I feel it would be an imposition upon your time to weary you with an exhaustive report of what has been accomplished in our state and which has been fully chronicled in our state dental journal.

However, before getting away from this movement in our own state, I should like to say a few words of commendation in regard to the work which is being done by the city of Detroit, of which we all should be justly proud, as this city stands pre-eminent today with Cleveland as a leader in this great oral hygiene movement. The work which is being done here in the school clinics and in the lectures before the school children, should be an inspiration to every dentist who is at all interested in this work. In the face of considerable opposition they have compelled educators, physicians and the public generally, to recognize in this movement a potent force for good among the growing generation of school children, and I believe we all owe a debt of gratitude to the dentists of Detroit, whose untiring energy has been responsible for the successful position their clinic occupies today, the influence of which is bound to extend throughout the length and breadth of our land.

I should like to see this subject given a more prominent position on our state program, and not come in under the head of the committee reports, as has been the case in previous years, as to my mind this is the most vital question in dentistry today, and it is our opportunity to compel recognition for our profession not as a highly developed art of mechanics, but that we occupy a position in preventive medicine second to none.

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*Read before the Michigan State Dental Society, 1914.

Dentistry has risen very rapidly in the past twenty years, and today is attracting men of greater refinement and higher literary attainments than has been the case in past years, and with this standard of the personnel of our ranks ever improving, it is not hard to estimate what a change for the better is bound to take place in the future. These men will have a higher conception of their profession and with the basis which is being given them to work upon, they are bound to evolve and create a more evenly balanced profession with not any less mechanics but with more preventive treatment. All of this may not seem pertinent to a report on "Oral Hygiene and Prophylaxis," but I believe that the question of the preliminary education is one that is to have a tremendous influence on the oral hygiene movement in dentistry, as the ranks of the profession will be filled with men who are capable of coping with questions more intricate than the mere mechanics of their profession.

I am very proud to be able to report that since our last state meeting the city of Grand Rapids has provided for a paid attendant at our local school clinic, and I am ashamed to relate that we have done nothing in the way of lectures to our school children, which, summed up, means that we succeeded in providing another form of charity for the children of the indigent poor in our city, which is one of the many forms of charity offered today, but insofar as accomplishing what is the underlying good in this work, and that is the education of the coming generation to the value of clean mouths and good teeth, it is more or less a farce, as I thoroughly believe that the same money spent for a paid teacher under the head of our board of education, or, as New York has it, under the head of the state board of health, would produce many times the benefits in the generation of school children now growing than any dental clinic, and that the really crying need in our schools today is for proper dental education. I do not wish to convey the impression that I am ignorant of the good that the dental clinics are doing throughout the country to the suffering children, together with the comprehensive plans of dental examination and reparation, but I do believe it is literally putting the cart before the horse.

In Grand Rapids, as in many other cities, the dental clinic comes under the head of the board of health, which I believe is the wrong place with its attendant possibilities of politics being injected into it. The dental clinic, to my mind, should come under the supervision of the poor board, with a dental lecturer directly under the supervision of the principal of the schools and under the control of the board of education, providing that board is elected at large.

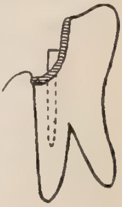
One word in regard to Dr. White, and that is that I am very glad to know that he is to be with us, and I am sure our progressive state society will readily fall in line as they have in all progressive measures in the past and take some action in securing a lecturer for the state of Michigan, and I for one thoroughly welcome Dr. White, and the movement he represents and will be glad to lend any assistance I can, to create sentiment in our locality favorable to the state employing some one in a like capacity.

During the history of dentistry there has never been to my knowledge a similar movement among dentists, which has been so unselfish in its motives. It is significant of the times. We are passing through a transitory period today in which the spirit of brotherly love prevails among men. We have our social welfare and betterment movements, all tending to the betterment of the race physically and morally, and it behooves the dentist to become inoculated with the spirit of the times and get together on a common ground and give whatever impetus he can to this oral hygiene propaganda. It matters not whether we may be specializing in one or the other of the various branches of dentistry, or whether we may be interested in the other fellow's hobby. Oral hygiene should still be the underlying thought, no matter at what angle we may approach our field of operation, and in conclusion I should like to say that every man within our ranks today who is practicing dentistry within its fullest sense is charged with a responsibility and that responsibility is the spreading of the gospel of oral hygiene and the safeguarding of the public health.

STAINING ARTIFICIAL TEETH—PRESSING BACK GUM TISSUE FROM BADLY BROKEN-DOWN TEETH*

BY F. A. HAMILTON, INDIANAPOLIS, INDIANA

This clinic consisted in showing the possibilities of staining artificial teeth with porcelain paints, emphasizing the ease with which pleasing results can be accomplished, especially when teeth have been ground to resemble the adjoining natural teeth. Also small gold and German silver "tack" for pushing back the gum tissue from about badly broken-down roots. Used in connection with temporary stopping or other gutta percha preparations.



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*Office Clinic, Indiana State Dental Society, 1914

MOUNTING INLAYS*

BY GEORGE BELL

In mounting inlays for casting, instead of mounting them on a cone of wax or a metallic cone, with a hole drilled in the center, a square base of wax is used and the inlay or inlays are mounted on this flat surface. The advantage gained is that the gold in the old cone method of mounting was hard to fuse at the base of the cone. In this method a larger area of crucible is gained, and consequently the mass of gold is thinner.

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*Clinic Kentucky State Dental Society, 1914.

HEALTH CONSERVATION

THE PRESIDENT: This meeting is being held under the auspices of the Michigan State Dental Society. Our slogan is to make health more contagious than disease. We expect to assist in doing this by spreading the gospel of mouth hygiene. We are very glad to see so many ladies present, because we know that the doctrine of a clean mouth is very much helped by the influence of good women. I feel that this is probably my last public appearance. I have an idea that tomorrow it will be all over for me. We have a list of speakers such as I do not think the people of this country have ever had the opportunity of listening to. There are a lot of things that I would like to say about them, but as there are so many of them, and they are such noted men, I am not going to say anything, but just introduce them in as short a way as possible. The first speaker is Dr. Homer C. Brown, the President of the National Dental Association, who is very much interested in the work that looks to the bettering of the health. He is a member of the Ohio State Board of Health, and a member of almost everything else that is good. We will listen to Dr. Brown.

ORAL HYGIENE CAMPAIGN*

BY HOMER C. BROWN, D.D.S., COLUMBUS, OHIO

I ASSURE YOU that it is a very great pleasure to meet with you on this occasion, and, as president of the organized dental profession of this country, and representing some 15,000 of the most aggressive and progressive dentists, I extend cordial greetings to the Michigan State Dental Society, a constituent society of the National Association, and to those who are present and interested in this very meritorious campaign. I wish to commend the officers and committees of this society for preparing such an excellent program on this, their 58th anniversary. I think the fact that they have arranged for a public meeting is very much to their credit.

The dental profession of Michigan has always been conspicuous for the things that they have done. This is evidenced by the fact that they have been able to bring sufficient influence to bear to secure their chief executive as a speaker tonight. In addition to that, the president of your state Board of Health and the president-elect of the American Medical Association, the superintendent of the Detroit schools, your health officer, Dr. White, from New York and the other distinguished speakers. I assure you it is inspiring to see these men present, and there is a distinct evidence that they are interested in this campaign.

The dental profession of this country is looking with a great deal of interest to the special work that is being done in the city of Detroit, through their health department. I have taken occasion very frequently to refer to this creditable work, and to the fact that it is being recognized and appreciated. That appreciation and recognition is evidenced by the gentlemen who are with us tonight. New York has been conspicuous for this work, and we are doing some things along this line in Ohio. Cleveland, in the last two or three weeks, has raised a fund in excess of $30,000.00, and before the 1st of May will have established six dental clinics. This fund was raised by subscription, and the fact that $30,000.00 was raised is not the most significant thing that was done, but the general education that goes with such a campaign is worth more than the money value of the fund.

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*An address before the Michigan Dental Society, 1914.

One of the most conspicuous recognitions accorded this particular work will be found in Boston in the Forsythe Dental Infirmary. That institution will be dedicated within the next few months. It costs more than $500,000 to construct and equip it, and it is endowed with something like $2,000,000. The funds were furnished by the Forsythe brothers. Its purpose is to provide dental service for the poor school children of Boston, and is a monument that stands alone in the world, and it may be years before another such an undertaking may be started, but from the evidence we have in this section of the country we need not be surprised to hear of Detroit having something of that kind, especially since so many automobile manufacturers are accumulating their fortunes so rapidly that they hardly know what to do with their surplus.

There was an interesting article in one of our local papers of Sunday's issue which shows the far-reaching effect of this question. I wish to quote from the president of the American Museum of Safety, Mr. Arthur Williams, of New York City. He says: "Teaching school children the proper care and preservation of their teeth is the very foundation of safety work. Not only will it make them healthier and happier men and women, but it will train them in caring for and protecting the rest of their bodies when they grow up and go to work. A boy or girl could have no greater physical asset than a sound set of teeth, good digestion and a clear brain." This is from a gentleman who is occupying an important position in the business world and I had the pleasure of meeting him at a meeting of this organization and discussing this particular subject.

I read a paper on "Oral Hygiene as a Factor in Human Efficiency" before a hygiene section of this organization in New York City, in December. I also made another clipping on the same day from a country paper which was headed, "Farm Notes." This contained suggestions to the farmers. It says: "Have a skilled veterinarian to make a careful examination of the teeth of old and young horses." Should we recognize the importance of the care of the teeth of the old or the young horses and neglect the teeth of the old and the young in the human family? I am very glad indeed to recognize the humanitarian thought that put this suggestion in that paper, but, ladies and gentlemen, we must thoroughly safeguard the health interests of the little ones who represent the men and women of the near future.

In Ohio we are conducting an educational health campaign, and I am very glad to be able to render such service as I can as the first dentist ever appointed as a member of a state Board of Health. And in the presence of the chief executive of this great state, and the president of your state Board of Health, I wish to say that nothing would please me more than to be advised at some early date that Michigan had followed Ohio, and had a dentist on her state Board of Health. Governor Ferris, if that should happen, I will send you a message of congratulations to show you that I enjoy having good company.

In our particular work in Ohio we are sending out an exhibit to the various county seats. This exhibit remains in one place one week, with a lecture each night. To show you how our Board looks upon this question, we have the oral hygiene side of the question presented along the same lines that we have the tuberculosis side, the occupational disease and the communicable diseases, sanitary engineering, etc. I have been obliged to neglect some of my duties in that connection. I was not scheduled for the town where we are exhibiting this week, but a special request came that we should have a dental lecture at Salem, Ohio, tonight. It was, of course, impossible for me to be in Detroit and Salem at the same time; therefore I telephoned to Cleveland and secured a substitute for the Salem meeting. This public work is such that it takes time and energy, but I often think that it is such work as this from which we get our greatest satisfaction.

There is a destiny which makes us brothers,
  None takes his way alone;
All that we send into the lives of others
  Comes back into our own.

MOUTH HYGIENE IN THE NEW YORK PUBLIC SCHOOLS*

BY DR. W. A. WHITE, NEW YORK
CONSULTANT AND LECTURER ON ORAL HYGIENE, NEW YORK STATE DEPARTMENT OF HEALTH

BEFORE INTRODUCING THE SLIDES with which I shall illustrate the lecture, I want to say a word or two regarding the subject we are to treat on tonight. It is not my intention to attempt to instruct anyone here on the subject of oral hygiene. My object in coming here is to illustrate the method which has been adopted by the State Health Department of New York for educating the boys and girls in the schools throughout the state.

The subject of oral hygiene is a comparatively new one in this country, but for many years throughout Europe, particularly in Germany, it has been regarded as one of the most essential and most important subjects to be taught in their schools, and it is included in the curriculum of every school throughout Germany, and is taught just as much as any other subject in their schools. It was not until after a thoroughly scientific investigation by those in charge of our health department that they recognized that the subject of oral hygiene is one that should be taught in the schools throughout our state, and as a medium of instruction they are sending lecturers through the state for the sole purpose of instructing those scholars as to what a clean, healthy mouth means with reference to their general health. In instructing these boys and girls through the medium of a slide, our first effort is to teach them what is meant by prophylaxis, which means prevention; hygiene, meaning cleanliness; and the third point, that a clean, healthy mouth prevents disease. They have learned, also, since this course of instruction has been carried on, that in some of the schools where strict attention has been given to the care of the mouth and teeth, many of the scholars have improved in their standing in school, as well as mentally, morally and physically, as high as 80 per cent.

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*An address before the Michigan State Dental Society, 1914.

We have also learned that from 45% to 49% of the failures in our schools throughout our state have been due to defective oral conditions; that is, a bad condition of the mouth and teeth. I would like to recite to you the result of my visits to the city of Poughkeepsie. I made my third visit there a week ago, and much to my satisfaction, and to that of the superintendent of schools, we learned by actual count that 38% of the boys and girls who had never given their mouth and teeth any attention had been to the dentists and had their mouths put in a healthy condition.

Before introducing these slides I want to quote to you the opinion of two or three of the most eminent medical men in the United States. Bear in mind I am not referring to a dentist. Dr. Mayo, of Rochester, Minn., in closing his remarks at the convention that many of you are acquainted with in Chicago, about a year ago, made this statement, that preventive medicine lies in the hands of the dental profession. He meant by that that it was the dentists' duty to instruct their patients, old and young, that in order to prevent disease, they should give their mouths careful consideration and attention.

Dr. Knegg, of New York, the recognized authority in this country on the treatment of tuberculosis, at the fourth International Medical Congress, held at Washington, D. C., in 1912, standing before an audience composed of the medical representatives of thirty-six foreign countries, the personal medical attendant of nearly every crowned head in Europe, and nearly every state in the United States being represented, made this statement: "I defy the most skilled physician to either help or cure a tubercular patient who has decayed teeth in his or her mouth." Dr. Jacobi, of New York, who is known particularly in New York as the grand old man in medicine, at the last Mouth Hygiene Congress, held in Buffalo, N. Y., said that if more attention were given the mouth and teeth, much less sickness among the old and young would exist. At the coming meeting of the New York Dental Association, held in May, we had expected to have on our program the late Dr. Parke, of Buffalo, known as one of the most skillful surgeons in this country, and he had chosen for his subject, "Septic Conditions of the Human Body, Directly Traceable to a Diseased Condition of the Mouth and Teeth." So you see I am simply quoting the opinion of the medical profession and showing how they regard the care of the mouth and teeth, and what it means to have a mouth free from diseased teeth.

I know if the governor of Michigan will take as active a part in this work as the governor of our state has, he will receive the same approbation. I hope he will not be put out of office, and I do not believe he could build a monument of marble which would last longer than if he were to build a monument inscribed "Oral Hygiene," by the appointment to the health department of his state of a man from the dental profession, or by establishing a division of oral hygiene.

I want to tell a story of a rich man who went into a dense forest. He engaged a guide; the guide had a belt on and in it were a hatchet, a revolver and three or four large knives. The guide clipped off a twig here and another one there, and after having repeated the operation a number of times, the gentleman said to the guide: "Why do you clip these branches off?" He replied, "I am blazing the trail, so that when others come this way they will know where to go and how to follow, and this will be a guide for them." That is what we are doing, talking oral hygiene—blazing the trail, teaching the boys and girls what a healthy, clean mouth means. If they follow these instructions, it will aid them in conserving their health, and aid them in growing up good, strong, healthy men and women.

THE DUTY OF THE STATE TOWARDS MOUTH HYGIENE*

BY GOV. WOODBRIDGE N. FERRIS, LANSING, MICHIGAN

I FIND MYSELF LIMITED IN TIME. That doesn't disturb me in the least, except that I see that I have an outline here that would last somewhere near two or three hours if I were to follow it. But I am fortunate, and you are fortunate, in a time limitation. I shall use my allotted time and no more. I am greatly pleased with the opportunity of coming here tonight. If I can find out what you want in Michigan, and if you can formulate it, and if by chance—it would be a chance—I were governor of Michigan next January, I would do my level best to see that you were served, and royally served. The idea of a Democrat anticipating the possibility of being governor for more than one term is extravagant, indeed. We might have to wait 22 years again; I don't know.

I cannot help but marvel at the changes that have occurred in my lifetime. I won't tell you exactly how old I am, but when I was a boy the ideas in relation to mouth hygiene and mouth sanitation were quite different from those of the present hour. I remember my father was the captain of a little home in which I lived, and if any of the children complained of an aching tooth, or a loose tooth, he hitched on a string and pulled it; and if he found that he hadn't sufficient strength, the family physician was called and he had an instrument that he hitched on and pried the tooth out, one or more, as the case might be. As soon as we did have a dentist my father's idea was that he was to pull teeth and make teeth; other than that he had no function.

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*An address before the Michigan State Dental Society, 1914

In tonight's lecture we have an illustration of modern ideas. If I had my way today we would make for the fundamental end of education, instruction and training for health, and not give it a subordinate place in our curriculum of education. I mean exactly what I say; not pretty nearly what I say. Up to the present our emphasis has been on enlightenment, upon getting knowledge and power and skill. But what do they avail if you ignore the first requisite? So, in education, I would have everything revolve around the one requirement, the health of the boy and girl. And I would emphasize just as enthusiastically the examination and sanitation of the eyes as I do of the teeth; likewise the organs of hearing, taste, smell and touch. Certainly sanitation relating to the five roadways to the human brain is important, and no dentist here will deny that. I realize you are justified in putting tremendous importance on mouth hygiene, because it is in the mouth that we have the beginning of the process of digestion, and all the senses and organs of the body depend upon an adequate supply of the right kind of food properly masticated. I recognize the importance of your claim, and wouldn't detract from it. But I would have you remember, also, the importance of the other senses.

I cannot stop here tonight, in the brief minutes given to me, to tell of my experience in the Ferris Institute, where we are trying to educate boys and girls, trying to upbuild and conserve them in all these ways. I want to say a little about mouth hygiene; not to give you any information, but to get at the one thing I am anxious to reach tonight in this brief discussion. On account of the lecture that has just been given, and on the presumption that I am talking largely to dentists, I don't need to take any time in talking about teeth from the standpoint of their use or their relation to health, or possibly their relation to disease. If I had the time I would read "The Human Mouth and Its Relation to Public Health," by W. G. Ebersole, secretary and treasurer of the National Mouth Hygiene Association, Cleveland, Ohio, on the subject of disease, but that I will forego because I am not presumptuous enough to think you men need that. You have had your attention called tonight to the fact that the mouth and decayed teeth form a kind of laboratory in which a hundred forms of germs may be brought forth. Your attention has been called to the importance of caring for these teeth among the children.

I want to emphasize one thing, because in my work as a teacher I find many of our mothers, many of our students, think the first teeth do not need any attention. I believe I would be supported by this association in saying that the first teeth need special care, in order that we may have the right kind of second teeth. I would thank you dentists to emphasize this whenever you have occasion to come in contact with teachers and this whenever you come in contact with teachers and mothers. What you are doing in Detroit is good; what you are doing in Rochester, N. Y., is all right; what you are doing in other cities is all right. You have the opportunity for doing these things.

But I am here tonight as Governor of Michigan to make an appeal, and ask of you dentists something for the smaller towns and villages of the state of Michigan. You can travel with special trains, and I say Amen to that. But I do say I want you to reach the hundreds and thousands of boys and girls in the little schoolhouses in the remote quarters of the state that will get none of these things until about 20 or 50 years from now. I want to see how you dentists and physicians and teachers can awaken interest in this matter. I hope I can find the little extract—I have it somewhere—from Dr. Osler, and I am sure you will recognize in him a man worthy of consideration. He says: "By far the most dangerous foe we have to fight is apathy." I have another word for it in my vocabulary—indifference. Indifference very often comes, not from lack of knowledge, but from careless effort, from the bad state of self-satisfaction. Fully 25 per cent. of the deaths in the community are due to this accursed apathy (he could have put a lot of other things in there) which goes far to abolish the achievement of the past century.

Why take pride in a wonderful railway system by which we traverse the land, when the supreme laws of health are neglected? Why take great pride in our material prosperity? What solution does the little schoolhouse afford when we know that a leaden apathy allows toll to be taken of every class from the little tots to the youths and maidens?

I want to emphasize the necessity and importance of awakening the people on this all-important subject. You know how it is in political affairs, in municipal affairs, etc. You know what your obstacles are. Your obstacle of obstacles is this kind of Rip-Van-Winkle sleep into which the average citizen has allowed himself to get. It is not something peculiar to us, but it is peculiar to all men and women who fail to make any progress in life. That is the only reason I have for being a school master. I like it. I enjoy waking people up. I enjoy touching them once in a while with a real prod, a real point, with a bit of steel, if necessary, in order to awaken them. I am anxious that we should tonight realize the importance of getting hold of the teachers in Michigan.

I cannot see why a teacher should be required to know something about ten or eleven subjects that relate to knowledge, and be excused from knowing all Dr. White has pictured to us tonight on the screen here; why they shouldn't tell something about these five great ways to the brain. Educationally, in Michigan, we must touch and reach the teachers, because they reach the boys and girls, and we must awaken in them some interest and pride in this subject of mouth hygiene. If you had all the teachers in Michigan here tonight, and passed them one after another under dental inspection, you would find a large number have teeth as unsightly as my own, and possibly more unsanitary. Again and again I have said to a young lady who came into my office and said, "Here is the money for my tuition," "No; go to the dentist and have those two incisors put in order. It is more important to you and to the boys and girls that you do that than that you pay me the tuition." Do you suppose she thanked me for it? Invariably she gets angry. I said to a young lady who had given $10.00 to help build a church: "Young lady, I am ashamed of you. There is a little hole there that is 1-16 to 1-8 of an inch in diameter, separating your two incisors, both decayed. You should have taken the ten dollars and gone to a dentist and put that in order, so that you might have been a worthy disciple of the Master."

I ask you dentists to reach the teachers of Michigan. You must reach them first in Michigan; secondly, you will reach the children. Bless your heart, I would be glad if half a dozen men like Dr. White were going around Michigan doing this work of instructing. So far as I am concerned, I am ready at any time to say Amen to anything of that kind. No governor should ever do anything to discourage the largest possible rational expenditure of money for health.

Next Sunday I am asked to tell in Grand Rapids what I most desire for Michigan. I have not hinted what it will be. I want to surprise them. The biggest thing in Michigan, in any state of the Union, is to conserve human life in its richest and fullest sense. I presume Dr. White would have told me that parents were invited to these lectures. Certainly where every child goes the mother and father should go. I do not think these things given to the boys and girls should be kept from the fathers and mothers. In God's name, how long shall we wait until we get the fathers and the mothers to come together to get instruction, to have the fathers and the mothers to come together to get instruction, to have a little enjoyment, some good music, and some of the good things of life? It would not be bad for them to get together. Consequently I would like this information to go to the parents. The press can do us some good. It has been very gracious and kind to me. Whenever it published what I actually did say I have been very grateful. But sometimes reporters are so anxious to get information before there is any information, and to get a decision before there is any decision, that they get things wrong.

I am enthusiastically in favor of a lecture such as has been given here tonight. Notice my line of travel: the teacher, the child, the parent, the press. I should be glad to take the thing up with the Board of Health. This year we couldn't do it. The amount of money the state Board of Health of Michigan gets won't permit. I won't mention the amount, and I don't want any man from any other state to make that inquiry. I am ashamed, but not shocked, and not discouraged, because I have lived in a city for thirty years, and have watched the dentists of my town. It seems to me this must be a kind of revival along the line of mouth hygiene, a kind of Billy Sunday affair you are holding. I don't want you to think I am throwing cold water, but what are you dentists doing in your own home towns? How many are going to the school boards and the teachers, and offering your services in the way of lecturing and instructing? I have been in a certain city for thirty years, and if any dentist has ventured out, he has done it so silently that I never discovered it. He hasn't been near my institution, and I have eight hundred pupils.

In Michigan there are 2,500 dentists. What can you do in the coming year? Within limits, you can awaken the whole state. It is within your power. Please don't sit back and lean upon the chief executive or the next legislature, or upon the dental association. Get busy, and let your light shine, if you have any.

I am in favor of the school clinic. Everything that has been said here tonight I endorse. Now, what are the difficulties? As I said when I read from Dr. Osler, there is this matter of apathy. You must appeal to boys and girls with motives that move them. Many of us are trying to do something for the world without realizing that the world, the child, the woman, never moves without some inducement, either from within or without. We must understand that. What good is it to talk to Johnny about cigarettes? You waste your time. Someone says, "The old man is in favor of cigarettes." Rubbish! You may as well charge me with being in favor of a thousand and one other things that I have discussed. And it is of no use to talk with Johnny about how fermented liquors are made. Why? Because there is no relation between the process of how fermented liquors are made and the boy's actually drinking fermented liquors. But if the boy should care about his physical body, and wanted to be manly and progress in life, and his physical attainments must be taken into consideration, and you told him that the cigarette would in all probability harm him and make him less progressive in his work, you would present a motive worth while. In that way you get hold of him.

A gentleman tonight, when I asked him what particular field of dentistry he was in, said he had to do largely with malformations of children's teeth and jaws and the machinery connected with the teeth. I said, "You practice among the rich, the well-to-do." People who are able to employ a dentist of that kind appreciate the beauty of the child, and there you have an appeal. I remember my youngest son in particular, when he came into the washroom, nine, ten or eleven years old, and said, "Papa, where is your nail brush?" I said, "In my suit case." He said, "Can I take it?" I never saw him use a nail brush or any other kind of a brush before. And he began to wash his hands, and I thought his fingers would drop off, joint by joint, and then he took a wash cloth and began to wash his neck and ears; and I said, "Phelps, what under heaven is her name, anyhow?" He didn't care anything about sanitation, no more than my dog, and thank God, my dog has been taken better care of by nature and God Almighty than my children. I don't know why, but that is the fact. We have all sorts of obstacles to meet, inside and outside, all the time, trying to shove us off the earth. But there was the motive. He wanted to please a certain creature that he hoped to walk with that evening, and consequently he was willing to clean his teeth and wash his ears and neck, even if after marriage he never washed them again. And if he didn't wash them afterwards, it would be from want of a motive. Consequently, you can get hold of people and boys and girls from the standpoint of good looks, because really the boy in the little log schoolhouse wants to look his best. That is a tremendous motive.

The motive of health is of value. Preaching alone amounts to nothing. The larger part of this work must be carried on through the school. There is no reason why drills in cleanliness should not be given as definitely and carefully in the schoolroom as arithmetic is, for the simple reason that it is fundamental.

I have wandered around in this brief time, trying to hit five or six things, and I say to you dentists and medical men, that so long as I am governor you need not worry. I am with you. Tell me what you want in legislation, and so far as I have opportunity and influence, you shall have it, because there is no danger that Michigan or any other state will make too large sacrifices by way of intelligent conservation of the teeth and eyes and other senses. In conclusion, let me ask you dentists to demonstrate to Michigan that you are alive. I hope that you are looking forward and longing to have the boys and girls of this state possess sound teeth and clean breaths and healthy bodies and brains.

INFILTRATION AND CONDUCTIVE ANESTHESIA*

BY DR. F. A. WILDASON, EATON, INDIANA

This is a method for painless extraction of nerves, extractions and oral surgery. I use it in the removal of impacted third molars, etc. It is on the order of conductive anesthesia. I make up a physiological salt solution, by using tablets. After I get my solution, I make up a novocain-adrenalin solution of whatever strength I deem necessary for my case. First spray out the mouth well. Then take a cotton roll and paint the field of operation with a strong antiseptic solution. Then draw up some of the solution in a syringe and inject in the mucous membrane over the field of operation for pulp extirpation or whatever the case may be. Then take up a No. ½ bur and drill through the mucous membrane into the cancellous tissue, into the bony process, from 1-16 to 3-16 of an inch. If the tissues are tough I inject three, one at a time. If the bur goes in easily I know the cells are open. Then I make the three punctures and inject, producing complete anesthesia, and the pulp is removed in from two to three minutes. You could do even major surgery, such as removing impacted third molars. Anesthesia will last thirty minutes. I have not had an after pain or sloughing of the gums.

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*Clinic Northern Indiana Dental Society, 1914.

EDITORIAL

Oral Hygiene and the Public Health

Attention to the mouth and teeth is being regarded more and more as an important factor in the conservation of health.

For years dentists have preached and talked oral hygiene but it has been only recently that physicians and surgeons have recognized what oral hygiene really means in the prevention of systemic diseases.

At the recent meeting of the American Medical Association, Dr. C. H. Mayo, noted surgeon of Rochester, Minn., said: "Certainly enough is known concerning infections and their mode of entrance, that the infected and diseased mouth and respiratory tract must be looked on as most serious menaces. Much may be done by more general and effective school inspection. The present generation will understand and demand protection for their children in time." He further said that both temporary and permanent teeth should be watched and filled, that irregularities of the teeth should be treated, narrowed dental arches should be widened, tonsils and adenoids looked after, thus preventing ear and mastoid diseases, rheumatism, endocarditis, etc.

Dr. E. C. Rosenow, prominent physician of Chicago, says: "The focus of infection is to be looked on not only as the place of entrance of the bacteria, but also the place where the organisms acquire the peculiar property necessary to infect. In the light of our present knowledge the argument that infections in the mouth are so common in individuals in apparent health, does not minimize their importance. These or other foci are so common in patients suffering from arthritis, neuritis, appendicitis, ulcer of the stomach and cholecystitis, goiter, etc., and so rare in individuals who have had superb health for years, that their direct etiologic role can scarcely be questioned. Probably the most common location of the focus or source of infection is the mouth."

Dentists can cite many cases where systemic disease has disappeared after needed attention to pathological oral conditions.

In Paris there is an American organization known as the American Ambulance Corps, engaged in the benevolent work of relieving suffering humanity. They have at present four hundred beds in their hospital and care for the wounded in battle.

The Americans began their work of healing by having free services of American dentists in Paris, several days a week. Every patient has his teeth and mouth looked after. They found that many men suffered more from their teeth than from their wounds. Inflamed gums were very common among the French and English. By attending to the teeth and gums, the American doctors discharge their cases ten days earlier than any other corps now working either with the Germans or the allies.

Recognizing the importance of mouth conditions to health, the MaGill University, Montreal, by recommendation of the medical faculty, will include in the physical examination of all students entering the university an examination of the mouth and teeth.

In Boston a few weeks ago there was dedicated a great benevolent institution, the Forsythe Dental Infirmary. Erected and equipped at an expense of nearly one million dollars and having an endowment fund of a million dollars more for its maintenance. It was founded by John H. Forsythe and Thomas A. Forsythe, in memory of their brothers, James B. and George H. Forsythe. Of the four brothers, only one, Thomas A. Forsythe, lived to see the completion of this great institution for the care of the teeth and pathological oral conditions of the worthy poor children of Boston.

At present there are sixty-five dental chairs in the infirmary, and room for at least one hundred and ten. This means that from five hundred to eight hundred poor children can receive each day the free services of competent dentists for their dental and oral troubles.

Nothing like this in the way of a dental charity for children ever has been approached, and it means much, not only for the children of Boston, but for the movement of oral hygiene the world over.

Various states have been active in the campaign for oral hygiene. Ohio, for instance, is doing a grand work. In the first place it has had for the past year a dentist on the State Board of Health. Beginning a year ago, this board commenced a campaign for educating the people of Ohio in matters pertaining to the conservation of health. It prepared a Public Health Exhibit which was quite elaborate and included a large number of electrical and mechanical devices which graphically emphasized the need of precaution in blocking the spread of preventable and infectious diseases. A dental exhibit was also added showing the necessity for oral hygiene and attention to the teeth and mouth. It was decided to carry the campaign into every part of the state, giving an entire week or more to each county. Every night during the exhibit there were free public lectures on health topics which were of definite interest to every citizen of the community in which the exhibit was being given. These lectures were given by experts in the different lines of health work, who were sent by the State Board of Health. Where possible the lectures were illustrated by specially prepared slides and moving picture films relating to the subjects under consideration. Oral hygiene was one of the subjects given attention at each meeting. On the closing night of the exhibit, remarks regarding the work were requested from a public, school and church official, a layman, a health officer, a physician and a dentist, and then a local Public Health League was formed to carry on the work in that district.

A year of this campaign has proven very successful and it will be continued at least until every county in the state has been visited.

Aside from what the State Board of Health is doing for oral hygiene, we have the work of the National Mouth Hygiene Association, the work of the oral hygiene committee of the State Dental Society, and the free dental clinics and talks in the larger cities of the state and inspection of the teeth of school children, and public talks on oral hygiene in many of the towns and communities of the state, and instruction on health matters, including dental and oral hygiene, is to be given in every county normal school through the State Superintendent of Public Instruction; all of which will do a great deal to disseminate a knowledge of oral hygiene among the masses.

If all the states were doing as much as Ohio to inform the people of the necessity of oral hygiene, an incalculable good would soon be accomplished.

But other states are active and we are glad to note that in a number of them the governor has, within the past year, appointed a dentist on the State Board of Health, thus following the example set by Ohio's executive a year and a half ago.

Over in our neighboring state of Michigan there is activity along the lines of health conservation. There is a bill in the legislature to co-ordinate the health service of the state, giving the State Board of Health authority to establish districts to the number of thirty within the state of Michigan, to be known as Public Health Inspection Districts, and in each district there shall be appointed a District Health Commissioner, which will extend the effectiveness of the board's work.

Also a bill empowering the State Board of Health to employ a Dental Surgeon who shall be recommended by the State Dental Society of Michigan, and whose salary shall be not more than $2,500, and all necessary expenses, whose duties shall be the inspection of school children and the teaching of the public in general, by means of lantern slides and other illustrations, the value of oral hygiene.

The great state of Michigan can do no greater service to its people than by establishing a lectureship on oral hygiene. This was tried last year by the New York State Board of Health, and from the enthusiastic reports of the work the beneficial results far exceeded in value the small amount appropriated to carry on the work.

See what has been accomplished in Detroit. Four or five years ago five or six public-spirited dentists of Detroit instituted at Grace Hospital a clinic where needy school children could have oral defects remedied, free of charge. But the plan at that time did not seem to appeal to the classes it was sought to reach. It was difficult to get those sorely in need of attention to respond to the invitation extended.

Nothing daunted, the men who had volunteered to give a generous portion of their time to the cause, realizing the seriousness of the situation, set about systematically spreading their propaganda with the co-operation of the public schools. Three years ago, by hard work, an appropriation of $5,000 was secured with which to carry on the work under the direction of the city Board of Health. Other clinics were instituted until today there are eleven of these free clinics and there are twenty-two dentists who devote all or a portion of their time to the work. Last month in the eleven free clinics maintained throughout the city, more than ten thousand of the needy poor among the school children were given treatment.

Dr. Oakman, president of the Detroit Board of Health, was one of the originators of the oral hygiene movement in Detroit, and it has been mainly through his efforts that such a splendid growth has been made. We do not know when Dr. Oakman's term of office expires, but we do hope, for the sake of the people of Michigan, that he may be maintained on the board until he can carry to a final issue this great campaign that has attained such great progress under his leadership. Think what the above results mean to a community; consider what it would mean to a state to have like instruction in oral hygiene and clinics everywhere throughout that state. Michigan has a broad-minded governor and a man greatly interested in everything that will conserve the health of her people.

In an address* before the Michigan State Dental Society, Gov. Ferris said: "I shall say to you dentists and medical men, that so long as I am governor you need not worry. I am with you. Tell me what you want in legislation and so far as I have opportunity and influence, you shall have it, because there is no danger that Michigan or any other state will make too large sacrifices by way of intelligent conservation of the teeth and eyes and other senses and of the human brain."

When the governor of a great commonwealth takes this attitude toward the health of the people, there should be no hesitancy on the part of a legislature to help the good work along by enacting legislation for the appointment of a dental surgeon to spread the gospel of oral hygiene, etc., to the people throughout the state.

When all the states get in line with an organized effort for the better care of the mouth and teeth of the inhabitants, there will be new records of longevity and a better race mentally, physically and morally.

*This address appears on another page in this issue of The Dental Summary—Editor.

The Other Extreme

Fate sets her laurel on your brow,
But, sure as you are born,
Misfortune sets her foot somehow
Right square upon your corn.

NEW PUBLICATIONS

Qualitative Chemical Analysis. A Laboratory Manual of Qualitative Chemical Analysis By A. R. Bliss, Jr., M.D., Ph.G., Professor of Chemistry and Pharmacy in the Birmingham Medical College. Octavo of 244 pages, with working tables. Philadelphia and London: W. B. Saunders Company, 1914. Cloth, $2.00 net.

In making notice of this concise manual we cannot give a better idea of what it contains than by quoting what the author has to say in his prefacing remarks: "This small volume has been prepared especially for the use of First Year Students of Medicine, Dentistry and Pharmacy in the Birmingham Medical College as a laboratory manual of Qualitative Chemical Analysis. The first third of the laboratory instruction in First Year Chemistry in this institution is devoted to a series of simple exercises illustrating and emphasizing the lecture subjects on General Chemistry. The remaining time is devoted to Qualitative Analysis. The object of this manual is to treat of the systematic procedure for detection and separation of the most common bases and acids in such manner as will enable the professional student to gain, in the short time allotted to this subject, a fair knowledge of the theory and methods of Elementary Qualitative Chemical Analysis."

A Manual of Dental Anatomy, Human and Comparative. By Charles S. Tomes, LL.D., F.R.S., F.R.C.S., seventh edition, edited by H.W. Marett Tims, M. A. (Cantab), M. D., M. Ch. (Edin.), F.L.S., F.Z.S., and A. Hopewell-Smith, L.R.C.P., M.R.C.S., L.D.S. (Eng.), with 300 illustrations, 616 pages. Price, $4.50 net. Published by P. Blakiston's Son & Co., Philadelphia.

Tomes' Dental Anatomy has long since become classic, and now that the present edition has had the benefit of revision to date by two such eminent men as the distinguished editors, the entire work may well be taken on faith. The work is divided into two parts: First, the Teeth of Man, and, second, Comparative Anatomy.

In Part I. the facts dealt with are such as are of more immediate value to the dental or medical student; while Part II. contains that which is of greater importance to the student of comparative anatomy. The latter part is by far more elaborate than the former, and aside from its scientific value, it will prove most interesting reading.

An attempt has been made to incorporate in the volume the results of recent research, a very difficult task to accomplish fully, owing to the number of and rapidity with which new facts in almost every branch of the subject are being constantly brought to light, but it has been done very acceptably. Those in need of a book on this subject will make no mistake in selecting this new edition.

Practical Orthodontia. By Martin Dewey, D.D.S., M.D., Professor of Dental Anatomy and Orthodontia, Kansas City Dental College; President of Dewey School of Orthodontia; Editor-in-chief, International Journal of Orthodontia. St. Louis: C. V. Mosby Co., Pub. 1914. Price, net $3.50.

Believing that there should be a book more suited to the needs of the dental student of orthodontia than any which we now have, the author has attempted to include in this volume certain principles which he has found to partially fulfill, at least, the needs of his students.

Occlusion being the basis of orthodontia, much space has been devoted to the different forces of occlusion and there has also been added a table giving the occlusion of each of the inclined planes of the teeth.

Causes of mal-occlusion have been taken up under different headings and described.

Under appliances, the author has confined his discussion to those which have proven their worth and which he believes will be successful in the greatest number of cases. The principles of retention have been carefully explained, for undoubtedly much unnecessary trouble has resulted in the past by not taking into consideration the principles involved.

Very little has been said about art as related to orthodontia. Neither has he dwelt upon the histological side of tooth movement or the development of bone, as these subjects he thinks should be taught by the chair of histology. Mention has been made of only such appliances as would be in keeping with physiological tooth movement and bone growth. The author has purposely omitted any reference to the disputed question of opening the suture as an aid to orthodontic treatment for he thinks these questions are still unsettled and therefore should not be incorporated in a work of this kind to confuse the student.

The author states that this book is not supposed to be the final solution of all things pertaining to orthodontia, but is intended for those interested in the subject who may be helped as a result of some of the author's experience gained during a period of twelve years as a teacher of orthodontia.

Notes on Dental Surgery and Pathology. By T. W. Widdowson. Licentiate in Dental Surgery of the Royal College of Surgeons, England; Late House Dental Surgeon to the Liverpool Dental Hospital; contributing editor to Oral Health, Toronto, Can. Author of notes on Dental Anatomy and Dental Histology, The Care and Regulation of Children's Teeth, etc. London, John Bale, Sons and Danielssohn, Ltd. Oxford House, 83-91 Gt. Titchfield St., Oxford St., W. Price, net 10s 6d.

This work is intended for both students and the general practitioner and is interleaved throughout with blank pages for notes and drawings.

The author first treats the deciduous teeth, their care and treatment, then the permanent dentition. Then follows Dental Caries, Inflammation, Injuries to Teeth due to causes other than caries, Diseases of the Pulp, Treatment and filling of root-canals, Diseases of the Alveolar Dental Periosteum, Diseases of the Gums and Mucous Membranes of the mouth, Saliva and Salivary Calculus, Odontomes, Odontalgia and Neuralgia, Empyema of the Maxillary Antrum, Necrosis of the Jaws, Fractures and Dislocations, Affections which may arise from dental neglect, Glossitis and Ulcers of the Tongue, Tooth Extractions and Complications and Bleaching of Discolored Teeth.

A concisely written and practical book containing much good information.

PRACTICAL SUGGESTIONS*

BY DR. L. W. DAILY, BLUFFTON, INDIANA

CASTING ABUTMENTS

(Lower Case)

Bridges had previously been inserted from cuspids posteriorly on both sides, the patient afterward losing the incisors from Rigg's disease. For retention of bridge, cut a dovetail channel deep into approximal surface of the bicuspid dummies, with pin in second bicuspid. Took impression of same and cast. Put them in place, took impression and made bridge in usual manner with porcelain anteriors. This bridge has been on three years.

FACING FOR GOLD CROWNS

Cut out labial surface of gold crowns with small fissure bur and fill with synthetic porcelain. This method makes old, unsightly gold crowns look good; can be done without removing crowns.

RESTORATION OF BROKEN TOOTH

Case of large corner broken off superior incisor. (Frequent occurrence with boys.) Make gold slipper crown, cement on, remove cement and fill with synthetic porcelain. Saves nerves, saves tooth; pleases patients.

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*Clinic Northern Indiana Dental Society, 1914.

OBITUARY

On the Death of Dr. C. R. Butler*

It seems fitting at this time that I should make some remarks about our beloved fellow member, Dr. C. R. Butler, who suddenly passed from among us (with neuralgia of the heart) December 15, 1914. It was my privilege to have been intimately acquainted with him since 1864, and in 1867-8-9 I was a student in the Ohio College of Dental Surgery where he was a member of the faculty; later on I was his assistant, and then a partner for twelve years, and candor, truth and justice prompt me to say that for a great many years he enjoyed a large practice and he will be greatly missed. He was an honest man, of somewhat retiring disposition, but very active in professional life, fraternally considerate and kind, ever ready to impart his knowledge to enquiring minds. We have lost a true and noble friend, and the profession has lost a bright particular star from its constellation, one who did much to elevate our standards, especially in the operative department, and the achievements he obtained hardly need to be recounted, so well are they known of men. It is a long way back into the story of dentistry that we can look from his height of vision, but when we do look, we see that the genius of dentistry rocked his cradle; his first office was in the Hoffman building, which stood on the present site of the Cuyahoga building; his second, 1864, was in a brick house (where he resided) on the present site of Child's restaurant, opposite the post office; his third at 15 Euclid Avenue, in a brick house where Dr. Strickland, a dentsit, resided, about on the site where the Standard Oil building is at present; his fourth at 114 (later 519) Euclid Avenue, in a brick building which he purchased, and where he resided in 1873, for about $6000 and about 1905 sold it for $20,000. This office was the second door in the apex of the triangle where Euclid and Huron coalesce; his fifth at 3912 Prospect Avenue, in a brick house now standing, which he purchased and where he resided until his decease, at which period he was the oldest practitioner in the city.

Success cannot be inherited, for all great men carve their own way and he certainly did. Thus we say all honor to him who was a pioneer of the times, and whose good deeds and accomplishments will not be forgotten while memory remains. He had a great inventive mind and made many instruments and tools, and he was an adept in using them. He seldom purchased anything in those lines that just suited, and so he made them over to suit his ideas. At his decease he had many tools of the carpenter, plumber, blacksmith, engineer and instruments of the architect, artist and chemist.

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*H. L. Ambler's remarks before the Cleveland City Dental Society, Jan. 4, 1915

Resolutions Passed by the Cleveland Dental Society

WHEREAS, Our Heavenly Father in His divine wisdom has seen fit to remove from the sphere of his earthly labors our esteemed friend and brother doctor, Charles Richard Butler; therefore be it

RESOLVED, That this society deeply mourns the loss of one of its most cherished charter members, one who ever displayed a kindness of nature and generosity of heart which will always be remembered with the warmset affection.

RESOLVED, That this society extends its heartfelt sympathy to his bereaved widow, relatives and friends.

RESOLVED, That these resolutions be spread on the minutes of this society and published in the dental journals, and a copy be forwarded to his widow, Mrs. Jane Eddy Butler, 1685 Van Burne street, St. Paul, Minn.

H. L. AMBLER, S. B. DEWEY,
H. F. HARVEY, J. F. STEPHAN,
F. M. CASTO, *Committee.*

Dr. R. E. Flory

We are again called upon to mourn the loss of one of our co-laborers—Dr. R. E. Flory. We shall miss his genial face at our meetings; we shall miss the kindly advice and assistance which any member of our society knew he could request, well knowing that it would be promptly granted.

We knew him; we loved him; we mourn him, and extend our humble condolences to the stricken family who will mourn him most.

A copy of this action shall be spread upon the minutes of our local society and upon the minutes of the Ohio State Dental Society, and a copy sent to Mrs. R. E. Flory and family.

THE MIAMI VALLEY DENTAL SOCIETY.

William Alfred Wilde

William Alfred Wilde, business manager of the *Dental Review*, and a resident of Chicago since 1852, died January 4th at the residence of his brother, F. L. Wilde, of 2338 Fairfax Ave., Morgan Park, Chicago. He was born in Bloomfield, N. J., and was 63 years old. Besides F. L. Wilde he is survived by another brother and three sisters. He was a Mason.

Dr. George Bertram Fifield Monk

Readers of THE SUMMARY, especially the younger graduates of the University of Michigan, will be grieved to learn of the death of Dr. George Bertram Fifield Monk, of London, England; University of Michigan graduate, 1913.

Dr. Monk recently entered the service as a private in the Warwickshire Regiment, was promoted to lieutenant in that body, and was killed shortly after reaching the front.

SOCIETY·ANNOUNCEMENTS

An Invitation to You

The Rehwinkle Dental Society (component of the Ohio State Dental Society), will hold another of its delightful and instructive annual meetings in Chillicothe, Ohio, at the Masonic Temple, on Saturday, February 13, 1915, afternoon and evening.

A most cordial invitation is extended to the profession in general. They want everybody to come. They promise to fill you full of "eats" and up-to-date dentistry. Those fellows don't do things half way—they go to the limit. It's worth your time just to see them hustle.

Look at the "big boys" who will perform: Dr. W. H. Whitslar, Cleveland, a paper, "What Will the Harvest Be?" Dr. W. O. Hulick, Cincinnati, a paper, "Up-to-date Methods in Crown and Bridge Work." And see who's here—look at these clinicians: Dr. J. R. Callahan, Cincinnati; Dr. L. L. Barber, Toledo; Dr. L. E. Custer, Dayton; Dr. C. I. Keely, Hamilton; Dr. A. O. Ross, Columbus; Dr. E. C. Hall, Columbus, and a dozen or more from the members of the society. You will miss one of the great treats of your life if you miss this meeting. There is no foot and mouth disease in Chillicothe; you won't be kicked out nor talked to death. Saturday, February 13th—make your reservation now.

Michigan State Dental Society

The fifty-ninth annual meeting of the Michigan State Dental Society will be held in Grand Rapids, April 15th, 16th, 17th. The committees are sparing neither time nor money to make this meeting more interesting, more instructive and more entertaining than any previous meeting. They ask the support of each individual to make this possible.

Essayists of national reputation have already accepted invitations. Names, subjects, etc., to be announced later.

F. Ward Howlett.

Odontological Society of Western Pennsylvania

The thirty-fourth annual meeting of the Odontological Society of Western Pennsylvania will be held at the Monongahela House, Pittsburgh, Pa., Tuesday and Wednesday, April 13 and 14, 1915.

The first regular session of the society will open on Tuesday at 10:30 A.M.

The executive council will meet at the hotel at 10:00 A.M. for the transaction of business in the interest of the society.

The clinics and exhibits will be at the Monongahela House. Exhibitors are cordially invited to visit this meeting, and requested to make early reservations for space. Address Dr. Leslie Waddill, Jenkins Arcade, Pittsburgh, Pa.

A cordial invitation is extended to all ethical dentists in Pennsylvania and adjoining states.

King S. Perry, *Secretary,*
719 Jenkins Bldg., Pittsburgh, Pa.

Texas State Dental Association

The thirty-fifth annual meeting of the Texas State Dental Association will be held in Galveston, Texas, May 19, 20, 21 and 22, 1915. The special feature of this meeting will be post-graduate lectures and clinic work.

Dr. G. Walter Ditmar, of Chicago, will present modern scientific bridge work and removable partial dentures, with preparations, technic and principles involved. Dr. B. F. Thielen will present "Plate Work;" Dr. T. G. Duckworth, "Orthodontia;" Dr. R. D. Griffins, "Nitrous Oxide Analgesia and Anesthesia;" Dr. Julian Smith, "Pyorrhea;" Dr. J. M. Murphy, "Local Anesthesia."

Exhibitors are requested to attend and to write Dr. A. L. Frew, Dallas, for space. General clinics, last day. Clinicians write Dr. W. H. Nugent, Fort Worth. For any other information write the secretary.

C. M. McCauley, *Pres.,*
Dallas, Texas.
W. O. Talbot, *Secy.-Treas.,*
Fort Worth, Texas.

South Carolina State Board of Dental Examiners

The next annual meeting of the South Carolina State Board of Dental Examiners will be held at Columbia, S. C., beginning at 9:00 A.M., Tuesday, June 15, 1915.

All applications must be in the hands of the secretary not later than June 5, 1915.

INSTRUCTIONS FOR APPLICANTS

The attention of applicants for license to practice dentistry in the State of South Carolina is respectfully called to the following rules and regulations:

I. All applications must be in the hands of the secretary ten (10) days before the meeting of the State Board of Dental Examiners.

II. Each application must be accompanied by a fee of $15.00.

III. Each application must be recommended by three ethical dentists from the applicant's home town or nearest towns.

IV. Each application must be accompanied by a photograph of the applicant on the back of which (photograph) must appear the signatures of the three dentists who recommend the application.

V. The minimum preliminary educational requirement is a State High School diploma or its equivalent—fourteen (14) units.

VI. Each applicant must present a diploma from a reputable dental college.

VII. The practical work in Operative Dentistry will consist of one gold foil filling, one silicate filling and one amalgam filling. Applicant to furnish instruments and material. Probably with an extraction and pulp removal.

VIII. The practical work in Prosthetic Dentistry will consist of full upper and lower set of vulcanite teeth articulated in wax. Applicant must furnish full upper and lower models on an articulator, also teeth and wax. The work to be done in the presence of the Board.

IX. The practical work in Crown and Bridge will consist of a four-tooth bridge from first bicuspid to second molar, inclusive. This bridge to be constructed in the presence of the Board of Examiners. Applicant will furnish articulated model, material and instruments. The Board of Examiners will furnish blow-pipe and investment material.

X. The theoretical examination will consist of written examination on all regular college branches.

Application blanks and instructions for applicants may be obtained by addressing
R. L. SPENCER, *Secretary*,
Bennettsville, S. C.

From the Panama-Pacific International Exposition

Another assurance that the European war will not harm the Panama-Pacific International Exposition came recently to James A. Barr, director of congresses and conventions of the Exposition. The Federation Dentaire Internationale, largely European in membership and the highest authority in dental matters, has chosen San Francisco as the 1915 meeting place from August 30th to September 9th.

The international character of this great organization is shown by the fact that the honorary president, Dr. W. B. Patterson, is of London; Dr. Truman H. Brophy, president, is of Chicago; the vice-presidents are of Paris, Edinburgh, Vienna, Buenos Aires, Frankfort-on-Main, Naples and Strassburg; the secretary general is from Madrid, and the assistant secretaries are of Brussels, The Hague, Paris and Madrid.

This federation has charge of the organization of all international dental congresses and is the clearing house for the most important dental questions. It is made up of the individual members of the profession, and means a great attendance, although there are no regular delegates. The entertainment of the members will be in the hands of the organizations of all the Pacific Coast states.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

MORE U. S. RESTRICTIONS ON COCAIN

Special Licenses for Dispensers—Public Records to be Kept—Washington Takes a Hand

All users of opium, cocain, morphine and other habit-forming drugs will be lined up in an official registration by the United States government on March 1, and dispensers, including the dentist, will be required to pay a special tax. Each will have to pay a special license of $1 a year and in addition keep an official register of the names of all persons to whom they sell or give away opium, coca leaves or any compound, manufacture, salt, derivative or preparation thereof.

The strictness of the new law, which was passed by congress December 17, is shown in the heavy penalty for failure to comply with its provisions. The act provides a fine of not exceeding $2,000 or imprisonment for not more than five years, or both fine and imprisonment.

Since the revenue derived from the special tax will be very small and only one-third of the annual tax is due at the time of the first payment, the object of the act is curtailment of the use of the drugs.

Whenever a person purchases the drug on an order a duplicate order must be kept by the seller and one by the buyer. In other cases, where no order is given, but where the drug is given in treatment by a physician in person or a dentist or similar person, there must be a registration.

These registers must be kept for two years and be open at all times to the inspection of the government agents.

In the few exemptions there is found provision for the surgeon and physician who makes purchases for government, state or municipal institutions. Exemptions are also made in the case of remedies that do not contain more than two grains of opium, or more than one-fourth of a grain of morphine, or more than one-eighth of a grain of heroin, or more than one grain of codeine, or any salt or derivative of them in one fluid ounce, or, if a solid or semi-solid preparation, in one avoirdupois ounce, or liniments, ointments, or other preparations which are for external use only, except liniments, ointments and other preparations *which contain cocain* or any of its salts, or alpha or beta eucaine or any of their salts, or any synthetic substitute for them.

A special provision is made that these articles exempted must be used for medicines and not for the purpose of evading the intentions of the law.

Exemption is made of decocainized coca leaves and preparations made from them.

WHAT IS DOING IN THE SOCIETIES

State Board Advocates Higher Standard

Columbus, O., Jan. 10.—"A menace to public health."

This is what the state dental board has to say of many of the private dental colleges of the country in its annual report to the governor. These colleges, the board says, maintain a national association of dental faculties that publish rules and regulations which, in many instances, exist only on paper.

No complaint is made of state schools. "Failures from this source are almost nil," the board says. The percentage of failures from private schools generally is large. Many of the questions asked in the entrance examinations conducted by private schools are said to be all but silly.

Recommendation is made that a law be enacted fixing a standard of preliminary education for those who apply for licenses to practice dentistry. Under the present law, the board must give the examination to any person who applies, regardless of his general education.

Ohio—Youngstown

Youngstown, O., Jan. 12.—At the regular monthly meeting of the Youngstown Dental Society Monday night, in the Hotel Ohio, the following officers for the ensuing year were elected: J. H. Chessrown, president; George Moore, of Girard, vice-president; H. H. Stafford, treasurer; H. W. Zellers, secretary. Twenty-five were in attendance and a dinner was given preceding the business session.

Michigan—Eighth District

Saginaw, Mich., Dec. 12.—At a meeting of the Eighth District Dental Association, Friday evening, the following officers were elected: President, Dr. Miller, Flint; first vice-president, Walter Moore, Saginaw; second vice-president, J. G. Schindler; secretary-treasurer, John Taylor, Flint.

About forty members were present from all parts of the district, and a fine banquet was enjoyed. The feature of the program was an address by E. T. Loeffler, of the dental faculty of the University of Michigan, and a former practitioner of Saginaw, who took for his subject, "Pain; Advantages and Disadvantages." Others who spoke during the evening were Dr. W. J. McMeeklin, Dr. Arthur S. Rogers and Dr. H. MacGregor.

Michigan—Delta County

Escanaba, Mich., Dec. 15.—Members of the Delta County Dental Society held their annual meeting and banquet at the Delta Hotel last night. The following officers were elected for the coming year: A. H. Kimmond, president; C. B. J. Kitchen, vice-president; R. E. Hodson, secretary and treasurer.

Indiana—Indianapolis

Indianapolis, Jan. 12.—The Indianapolis Dental Society held its eighth annual clinic in Indianapolis yesterday, with dentists in attendance from all over the state. The clinic began in the afternoon at the Indiana Dental College, and was continued in the evening at the Hotel Severin. No less than twenty subjects of interest to the profession were discussed at the opening session, and in the afternoon Attorney Arthur M. Hood addressed the assembly on "The Possible Effect of Patents on the Professional Man," with an address by Dr. Bremner, of Chicago, closing the work at the college.

The dentists gathered in the evening at the Hotel Severin, where dinner was served to more than 100, after which they were addressed by Dr. J. R. Callahan, of Cincinnati, on "A New Method of Root Filling." The officers of the society are Charles R. Jackson, president; Howard R. Raper, vice-president; Roy L. Bodine, secretary; Silas J. Carr, treasurer.

Dr. Bodine, who was elected secretary for the fifth year, showed that the society had gained thirty members for the year, making the total membership 155.

Great Work of Evanston Clinic

Evanston, Ill., Dec. 21.—Evanston's Dental Infirmary, where those unable to pay are given free dental treatment by the best city dentists, is now in the second month of its operation, and the result has been even better than the most sanguine of its friends and supporters had hoped for. It is being satisfactorily proved that the majority of the unruly and unmanageable school children become tractable and obedient when their teeth have been properly treated. The Evanston dentists were very generous in the promise of their services, and have given them ungrudgingly as they promised they would.

Of the 24 dentists asked to give their services, 23 responded graciously, and have taken the assignments given them. It was found that this would permit the keeping of the dispensary open and the giving of dental service every afternoon during the week, except Saturdays and Sundays.

During the 23 days in November that the clinic was operated, there were 41 patients treated. Nearly all of these were badly in need of dental work, so that each one took considerable time. There were 67 amalgam fillings put in and 38 of oxyphosphate, besides four linings of the copper and 17 permanent extractions; besides 23 of the deciduous variety.

So great has been the demand for treatment here that appointments now have to be made three weeks or a month in advance. The patients come through the Associated Charities, no one being treated who is supposed to be able to pay, and especial effort being made to care for the children of the poor who are in greatest need of dental work.

Illinois—Will-Grundy County

Joliet, Ill.,—Following a dinner given recently the following officers of the Will-Grundy County Dental Society were elected for 1915: President, A. G. Harrison, Morris, Ill.; vice-president, S. Gasparovich, Joliet; secretary-treasurer, A. B. Patterson, Joliet; librarian, W. C. Clyne, Joliet. Committees appointed were: Program, T. T. Mulford; censors, T. M. Collins, H. Copley, G. W. Young; membership, A. G. Harrison, S. Gasparovich, A. B. Patterson. The society passed a resolution endorsing the work of the Joliet Public Health Central Bureau, and the Joliet members of the society agreed to raise a subscription to aid the bureau in its work among the poor.

Illinois—Belvidere-Rockford

Belvidere, Dec. 18.—About twenty-six dentists attended the banquet given at the Leland cafe last evening. Election of officers followed the banquet:

F. A. Weld, Belvidere, president; Dr. Walker, Rockford, vice-president; Dr. Harrison, Rockford, treasurer; Dr. Witherstine, Rockford, secretary.

The next meeting will be at the Nelson House in Rockford in January.

Wisconsin—Waukesha County

Oconomowoc, Wis., Jan. 1.—The Waukesha County Dental Society, which was formed at a meeting here last fall, was formally organized at a meeting held Monday evening at the Schlitz Hotel in Oconomowoc and the officers chosen at the previous meeting will be retained in office until the annual meeting of the association, on Tuesday, Feb. 9, at Waukesha.

The officers are: President, L. A. Meyer; vice-president, R. T. Jones; treasurer, F. F. Machus; secretary, Ellsworth Jones. The following committees were appointed: Board of censors, F. F. Machus, R. T. Jones, A. C. Coyle, of Oconomowoc. Membership committee, M. E. Johnson and T. H. Roach, of Waukesha; F. N. Hansen, of Hartland; Lynford Lardner, of Oconomowoc, and M. F. Welton, of Pewaukee. Program committee, G. W. C. Meyer, of Oconomowoc; W. H. Chapman and W. A. MacFarland, of Waukesha.

Wisconsin—Kenosha County

Kenosha, Wis., Dec. 19.—The Kenosha County Dental Society, component of the Wisconsin State Dental Society, met last evening and elected the following officers: President, Dr. Lane; vice-president, Dr. Kaltenbach; secretary, Dr. Flattery; treasurer, Dr. Ryan; librarian, Dr. Cheever. Board of censors, Dr. McGrory, the retiring president, Dr. Lane, Dr. Kaltenbach.

Kentucky—The "Pennyrile" Society

Bowling Green, Ky., Jan. 11.—Dentists from Warren, Allen, Logan, Simpson, Todd and Barren Counties met in this city today for the purpose of organizing a society to study the advancement of dentistry. The name of the organization will be "The Pennyrile Dental Society." The society will meet monthly and the first meeting will be held here on Friday, February 12. Officers were elected as follows: W. C. Taylor, Glasgow, president; William Fleenor, Russellville, vice-president; James W. Blackburn, of this city, secretary; and B. W. Neeley, of Franklin, treasurer.

Missouri—Southwestern

Joplin, Dec. 15.—A banquet in the Connor Hotel last night closed a meeting of the Southwestern Missouri Dental Association. In session yesterday the association elected officers as follows: President, L. B. Kissell of Joplin; vice-president C. C. Johnson, of Webb City; secretary, J. D. Sheldon, of Joplin; treasurer, W. W. Brown, of Neosho.

Dr. W. D. Tremper, dentist of Portsmouth, Ohio, was elected State Senator from his district at the recent election.

California—San Joaquin Valley

Fresno, Cal., Jan. 10.—The San Joaquin Dental Society held a meeting at the University Club last night and discussed many subjects of importance to the members. Twenty-five were present, including O. J. Howard, president, Howard S. Duff, treasurer, and E. L. Hopkins, secretary.

Five School Clinics in Pennsylvania

Pittsburgh, Dec. 29.—Details for an ambitious program for physical betterment in the Pittsburgh public schools were made known today, when director H. B. Burns, of the department of hygiene, announced the opening of five fully equipped dental clinics.

Ten registered dentists will be on duty six days a week caring for the teeth of children who enter the lower grades. Arrangements were also made to open the optical department.

New York—Alumni U. of B.

Buffalo, N. Y., Jan. 7.—The 15th annual "clinic" of the Alumni Association of the dental department, University of Buffalo, will be held at the Hotel Iroquois, February 5 and 6. One of the most unique novelties in the history of the clinic is being arranged. Lecturers and clinicians with international reputations have been engaged from New York, Chicago, Toronto and other cities.

New York—Kings County

Brooklyn, Dec. 11.—Dr. Weston A. Price, of Cleveland, Ohio, was the principal speaker last evening at the regular meeting of the Kings County Dental Society. His subject was "Oral Sepsis and Systemic Infection in the Light of Recent Researches."

Dr. Price is known as the "Thomas Edison," "George Westinghouse" or the up-to-the-minute "Benjamin Franklin" of dentistry.

At 6:00 P.M. a complimentary dinner was tendered to Dr. Price at the Hotel Bossert, at which many dentists were present.

The officers of the society are: Maurice William, president; L. Herman, vice-president; J. J. Stern, secretary; J. Pensack, treasurer, and J. Lief, librarian.

Getting New Teeth at 60

Fremont, O., Dec. 26.—Although 60, Andrew Koebel, of Rawson Avenue, announces he is getting a brand new set of teeth. Koebel looks scarcely 45, has a full head of hair and appears in excellent physical condition.

Memphis is to have free dental clinic and dispensary.

LISTERINE IN ORTHODONTIA

In the practice of orthodontia there is no antiseptic so welcome to the patient—none more efficient or lasting in results as

Listerine

Successful orthodontists regard Listerine as an indispensable antiseptic because of its reliability, high efficiency, uniform strength and agreeable taste.

Listerine is a saturated solution of boric acid, supplemented with the oils of eucalyptus, thyme, mentha, gaultheria and baptisia.

Successful dentists are daily demonstrating the fallacy of using alkaline mouth washes, whose reaction tends to impair the natural secretions of the oral cavity.

The slight acidity of Listerine stimulates the flow of saliva and increases its preservative power.

Lambert Pharmacal Company
St. Louis, Mo.

DEATHS

At Milwaukee, Wis., January 7, Dr. Thomas S. Phillips, the famous dentist who practiced in Buffalo, N. Y., for 42 years. Death is said to have resulted from grief for a son who died two years ago. The body was cremated at Buffalo under Masonic auspices.

At Pittsburgh, Pa., January 5, Dr. Harry M. King; carbolic acid.

At Woodman Sanitarium, near Denver, Colo., January 5, Dr. J. W. McIntyre, of Oak Park, Ill.; tuberculosis.

At Beloit, Wis., January 4, Dr. B. A. Edwards, aged 40.

At Boston, January 2, Dr. James S. Shaw, aged 76. At the time of his death he was a professor at Boston University Medical School; a brother of Anna Howard Shaw, the suffragist.

At Spring Valley, Ill., January 2, Dr. Frank O. Finley, of Chicago, aged 46.

At Baltimore, Md., January 3, Dr. Harrison A. Freeman, of erysipelas, aged 33.

At Los Angeles, Cal., December 25, Dr. J. C. Whinnery, of Omaha, Neb.

At Baltimore, Md., December 20, Dr. Charles E. Wingo, aged 57. On December 18th his father, Dr. C. C. Wingo, celebrated his ninety-first birthday. His practice will be carried on by his son, Dr. Chas. E. Wingo, Jr., making the third generation to practice at the same location.

At Saginaw, Mich., December 22, of pneumonia, Dr. W. P. Morgan, aged 66. He retired two years ago, after active practice of 42 years.

At Gibson City, Ill., December 13, Dr. William C. Chapman, aged 44.

At Pinckneyville, Ill., December 15, of paralysis, Dr. Emmet Peyton, aged 48.

At Decatur, Mich., January 6, Dr. N. E. Hooper, of the firm of Hooper & Huyck.

At Dayton, Ohio, December 14, Dr. C. H. Leaman, aged 69, from a throat and stomach malady, following an illness of several months. He was the oldest practicing dentist in the city. He served in the navy during the civil war and was prominent as a Mason, Odd Fellow and Knight of Pythias.

At Gray's Lake, Ill., Januay 6, Dr. C. C. Whitmore, of Chicago.

At Traverse City, Mich., January 5, Dr. Allen Vaughan, of Cadillac.

At New London, Wis., January 13, Dr. W. K. Delano, the oldest dentist in the city and one of the most prominent members of the profession in central Wisconsin.

However, a man may not be married and still have his troubles.

ROBBERIES

Chicago, Jan. 13.—Dr. F. F. Schwartz, $500. The thieves also blew door off new safe that was empty.

Springfield, Mo., Jan. 9.—Dr. A. O. McCutcheon, gold, $100.

Palestine, Texas, Jan. 6.—Several offices; value of loot not stated in report.

Louisville, Ky., Jan. 3.—Dr. E. M. Redman, assaulted, beaten to insensibility and robbed in street hold-up; $300.

Carthage, Mo., Jan. 7.—Dr. Hardoway and Butcher; $50.

Marquette, Mich., Jan. 5.—Dr. W. P. Finlan; $90.

Ardmore, Pa., Dec. 27—Dr. J. W. Goddard; $75.

Norristown, Pa., Dec. 27.—Dr. M. K. Mayer; $100.

Stolen Gold Identified

Rochester, Mich., Dec. 12.—Dental gold stolen from the offices of Doctors Curtis and Lasendy, of Rochester, has been identified among gold found in Saginaw as the result of the arrest of John Holmes, forty years old, of New York, at Plymouth. Holmes, who is alleged to have been robbing dentists' offices in this part of the state for some time, had about thirty dollars' worth of gold on him when captured in Plymouth, and the gold lost by the Rochester doctors was valued at about seventy dollars.

Alabama Negro Arrested

Birmingham, Dec. 16.—George Dorsey, a negro, is under arrest, charged with a series of dental robberies. The following are among the offices reported to have been robbed: Drs. L. and J. G. Caldwell, and Dr. J. A. White, First National Bank building; Dr. R. J. McGavrock, Woodward building; Dr. J. A. Blue, Brown-Marx building; Dr. J. E. Roost, Farley building, and several others.

How About That Jonah Story Now?

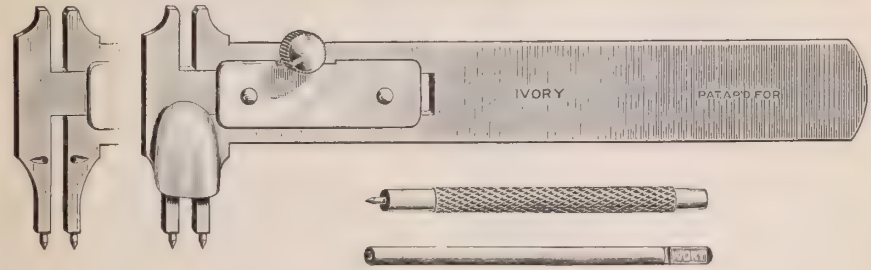
Providence, R. I., Dec. 30.—James Skeffington, of the Providence school committee, was polishing his teeth yesterday when his grip of the handle of the brush slipped. The brush went down his throat so far he could not reach it. Involuntarily he swallowed it.

Mr. Skeffington caused a call to be sent to the Rhode Island hospital, where he was taken for an operation. The brush was removed from his stomach and the patient was reported as doing finely.

The average boarding house chicken is a great help to the dentist.

MASON'S
Spacing Caliper and Auxiliaries

Patent Applied For



THIS Spacing Caliper provides an easy method for adapting backings to facings so that it is impossible for the flux or the solder to come in contact with the porcelain, thus eliminating checking.

Operation

The pins of the facing are placed in the holes on the side of the Caliper which have guide slots to guide the pins into the holes; this accurately spaces the holes which register with pins of the tooth, held in that position by the thumb nut; the backing is then marked or pierced by the hardened points which give the exact spacing for the pins; now place the backing thus marked on a piece of lead; then with the pointed punch the metal or gold is pierced, throwing up a lip; giving an aperture the same size of the pin; the backing thus pierced is placed on the tooth, the lips extending on the pins, finally to burnish this lip of gold to the pins, the engine or lathe tool is used, which has an aperture in the end of the same, which fits over the pins, then with a high speed of the engine or lathe the gold is burnished around the pins, which after examination will show that the gold is spun up around the pins, as though attached to them; furthermore the biting or other edges of the teeth may have the backing burnished over them without displacing the metal from the pins; this is economical as that part of the pin extending instead of being bent over "as usually done" may be clipped off.

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Teeth of the Wounded

The great work of the American ambulance corps operating in Paris is attracting attention. It was founded in 1870, and did good service then. It has since been reorganized by the American colony in Paris. Mrs. Vanderbilt and other Americans have supplied money, and the French government has furnished quarters. At the battle of the Marne ambulances arrived on call in two hours that were not expected under twelve. It is the marvel of the French for this quickness, and also for the quality of its service. It gets its patients well ten days sooner than any other corps, working either for the Germans or the allies. One great factor is the services of the best American dentist in Paris to tend to the teeth of the wounded. Every one is thus treated. It is found that the English have the worst teeth and the Arabs the best. The Moroccans and Algerians have almost perfect teeth. Inflamed gums are common among both English and French patients, and they often suffer worse from their teeth than from their wounds. It is the putting of the teeth in order that enables the American corps to cure their patients on an average ten days sooner than others. But they also are noted for the restorations they make in desperate cases. In short, American surgery has taken first rank in this war, and is welcomed by the Germans and the allies everywhere.

Strange Case For Dentists

Big Laurel, Va., Dec. 10.—Edward Sowards, who lives on the Black Mountain a few miles north of here, is in a serious condition owing to the abnormal growth of his teeth. About five months ago he discovered that his teeth were becoming longer and more prominent. He consulted a dentist, who advised him to have them trimmed. He did so and soon after they began to grow faster than at first. He had them sawed off again, but they continued to grow. The best doctors were called in but none can tell the cause of this strange affliction. At this time his teeth are almost an inch long and are turning backward in his mouth, so that eating is difficult; hence there are fears that the disease may result fatally.

Bad Teeth Blamed for Ills

Madison, Wis., Jan. 6.—The first complete investigation of defects of country school children was reported by Dr. W. C. Bennett, of Rhinelander, deputy state health officer, when he sent in a report for Oneida county. Dr. Bennett found an apparent relation between decayed teeth and certain morbid conditions among school children. Of 134 cases of children who complained of earache, 73 per cent. had decayed teeth; of 180 "mouth breathers," 60 per cent. had decayed teeth and of 56 who had goiter, 64 per cent. had decayed teeth.

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The individual dentist may have his ideas in arranging his own offices, but the true expert is one who has had experience in the development of a large number of offices, under many varying conditions, and subject to varying tastes.

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THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV MARCH, 1915 No. 3

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REGULAR CONTRIBUTIONS

CAVITY PREPARATION FOR GOLD INLAYS*

BY R. H. VOLLAND, M.D., D.D.S., IOWA CITY, IOWA

PROFESSOR OF OPERATIVE TECHNIC AND DENTAL PATHOLOGY COLLEGE OF DENTISTRY UNIVERSITY OF IOWA

IT WILL BE THE ENDEAVOR in this clinic to demonstrate the principles involved in the ordinary cavity preparations for gold inlays. Special attention is called to the fact that the cavities in these models are prepared, insofar as possible, along the lines laid down by Doctor Black for foil fillings. "Extension for Prevention" is accomplished. Resistance form, retention form, bevel of cavo-surface angle, and toilet of cavity can be followed with only slight modifications from the standard types—modifications made in order to apply the inlay principle. Such modifications are easily seen in the models.

The first class of cavity I wish to discuss is the simple proximal cavity in incisors and cuspids. In order to apply the inlay principle most satisfactorily to this type of case, it is best to make the inlay shed toward the lingual. This requires that the gingival wall diverge from the incisal wall lingually and that the lingual wall be cut continuous with the axial wall. (Ill. I-2.) A slight dove-tail outline of the lingual margin is necessary. This dovetail is cut in the gingivo-axial and the inciso-axial angles. It fades out as it extends labially and is completely lost at the extremities to the labio-axial angle. The labial wall is cut at right angles to the axial wall and acts as a stop wall or a definite resistance plane. The labial outline is similar to that used for a foil filling. (Ill. I-1.) All the cavo-surface angle of this cavity may be beveled except the labial margin. The reason is

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*Clinic at Indiana State Dental Society, 1914.

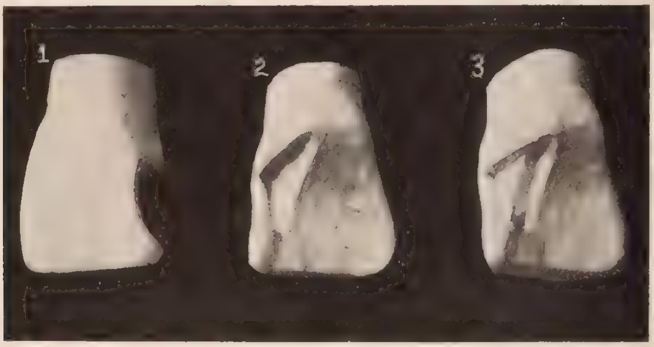

Illustration No. I.

Proximal cavities in incisors.

1. Labial view.
2. Lingual view of one type of cavity.
3. Lingual view of a second type of cavity.

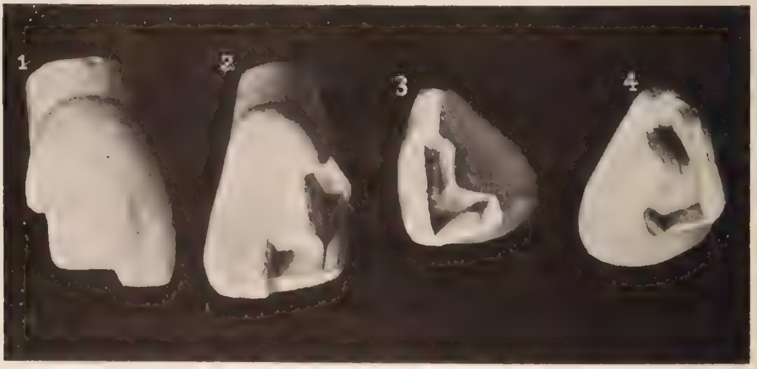

Illustration No. II

Proximo-incisal cavities in incisors and cuspids.

1. Labial view of cavity in upper central incisor.
2. Lingual view of cavity in upper central incisor.
3. Incisal view of cavity in upper central incisor.
4. View of the same type of cavity in upper cuspid.

obvious. When an inlay is made and set in this type of cavity it is mechanically locked against all ordinary forms of stress.

In very shallow decays it may be advisable to use this second type of preparation (Ill. I-3) in which some of the lingual plate of enamel is sacrificed in order to provide for the dove-tail. This type of cavity does not require the sacrifice of much dentine on the proximal axial wall. Such a cavity is just as mechanically correct as the first and the axial wall in the lingual portion of the cavity provides a second resistance plane.

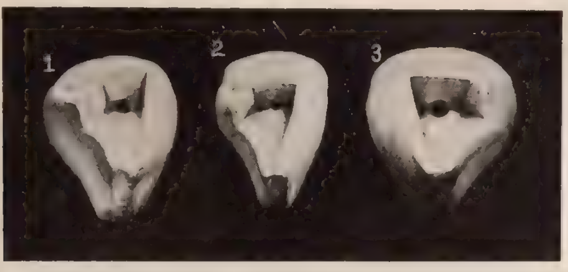

Illustration No. III

Proximo-incisal cavities in incisors and cuspids.

1. Cavity in upper central.
2. Cavity in upper lateral.
3. Cavity in upper cuspid.

NOTE—In cavities 1 and 2 the lingual wall is extended for prevention. Such a form may be used in 3 and in the cavities of Ill. II. if necessary, in order to bring the margin in a clean area.

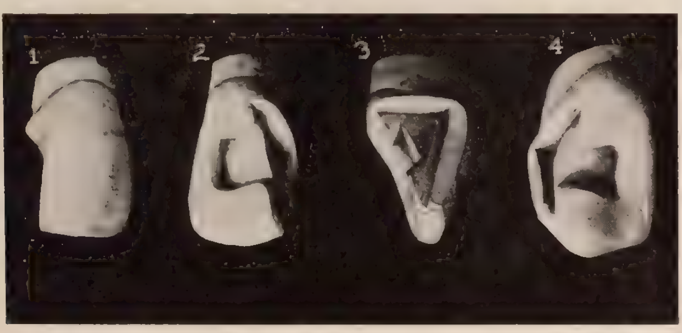

Illustration No. IV

Proximo-incisal cavities in incisors and cuspids.

1. Labial view of a cavity in an upper lateral.
2. Lingual view of the same cavity.
3. Proximal view of the same cavity.
4. Lingual view of such a cavity in an upper cuspid.

The next type of cavity is for proximo-incisal restorations. The models show three forms of cavity preparation. The first form is very similar to the Johnson step or Black preparation, but the principal modification in this form is the cutting of a short lingual wall at an obtuse angle to the gingival wall and at a right angle to the axial wall (Ill. II-2, 3, 4). The formation of this short lingual wall, together with a labial wall cut at right angles to the gingival and axial walls provides as nearly box resistance form at the gingival half of the cavity as it is possible to make. The inlay is anchored incisally by the use of a small pin in the pulpal wall. (Ill. II-3, 4.)

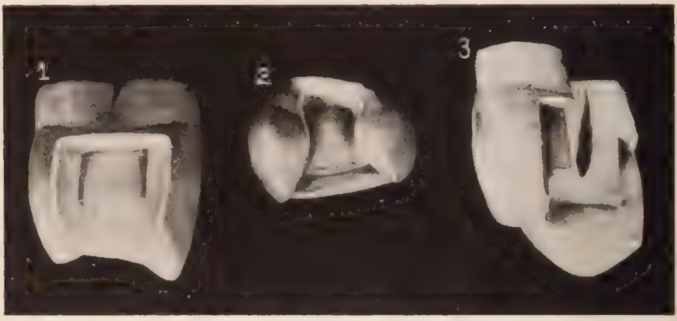

Illustration No. V

Proximo-occlusal cavity in an upper bicuspid.

1. Proximal view.
2. Occlusal view.
3. Mesio-distal longitudinal section showing relation of gingival, axial and pulpal walls.

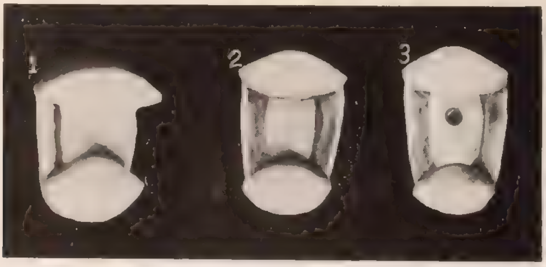

Illustration No. VI

Mesio-occlusal-distal cavities in upper bicuspids.

1. Occlusal view of ordinary type.
2. Occlusal view where cusps must be cut down.
3. Occlusal view where cusps must be cut down and post is used in the root canal for anchorage.

The second of this group of cavities is that in which a post in the root canal is used as an anchorage. The labial outline of this cavity is straight from the incisal toward the gingival, and blends into the gingival outline with a rounded angle. The gingival margin is straight labio-lingually and at right angles to the long axis of the tooth. A short lingual wall, bearing the same relation to the axial and gingival walls as in the preceding cavity form, is provided, and thus a sort of step is made in the lingual outline. The axial and gingival walls are flat and at right angles to each other. The labial wall is made at right angles to the axial wall. The root canal is enlarged and a heavy post fitted to it for anchorage. The cavo-surface angles are beveled in the usual manner.

The last of these forms is similar to the second but a dove-tail is cut in the lingual plate of enamel to provide for anchorage. The short lingual wall is cut away entirely and the gingival wall is cut straight through to the lingual surface. The lingual wall is cut continuous with the axial wall. The labial wall is cut at right angles to the axial wall and acts as a resistance plane, since the inlay sheds toward the lingual. All the cavo-surface angle is beveled except on the labial. This type of cavity can be used where the pulp is vital.

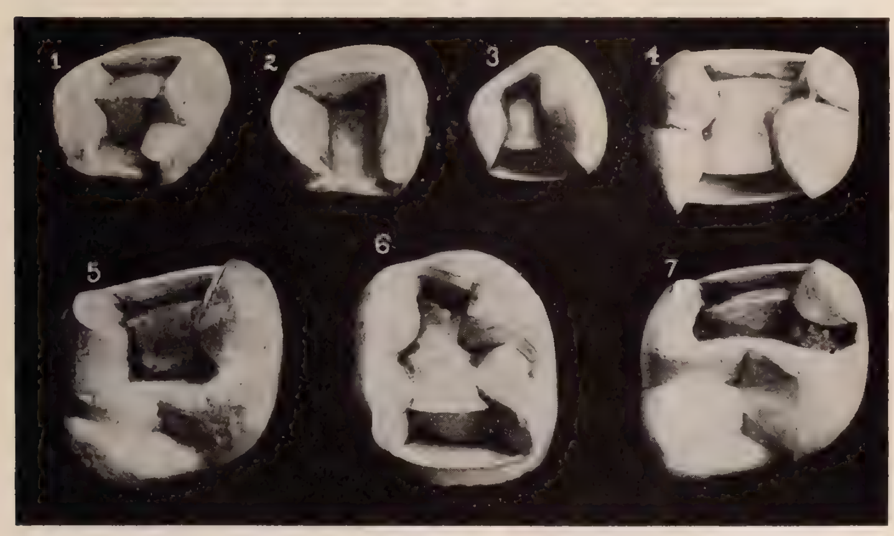

Illustration No. VII

Proximo-occlusal cavities in molars and bicuspids.

1. Proximo-occlusal cavity in upper bicuspid when necessary to sacrifice some of buccal plate of enamel.

2. Proximo-occlusal cavity in bicuspid where pulp has been removed and there has been extensive decay. A post is used in the root canal for anchorage.

3. Ordinary proximo-occlusal cavity in a lower bicuspid.

4. A mesio-occluso-distal cavity in an upper molar—pulp vital.

5. An ordinary mesio-occlusal cavity in an upper molar.

6. A mesio-occlusal cavity in a lower first molar where extension along the buccal groove is necessary and the mesio-buccal cusp is much weakened.

7. A disto-occlusal cavity in an upper molar where the disto-lingual fissure is followed out to give retention.

The inlay cavities in the molar and bicuspid models are all prepared along the conventional lines of the foil-filling cavities. Outline form, extension for prevention, resistance form, retention form by outline and preparation of enamel walls and margins are carried out in the same manner and for the same purpose as in foil cavities; of course, convenience and retention angles cannot be used. The ordinary proximo-occlusal cavity needs very little discussion. In the mesio-occluso-distal cavities in molars and bicuspids especial attention should be given to the cusps. If there is any danger of their being broken by stress of mastication, it is good practice to cut them back and build the inlay over them. Especially is this true in pulpless teeth. In some cases in pulpless teeth it is advisable to use a heavy post in the root canal as additional anchorage (Ill. VI-3). In the molars many times the pulp chambers can be cut into a box form, the inlay carried into it, and the necessity of a post as anchorage be done away with.

The large inlay in molars and bicuspids is preferable to a band crown because with the inlay gingival irritation is minimized. The use of posts and pins as anchorage and the cutting back of weakened walls and cusps often make a much better restoration than even a bandless or shoulder crown.

OCCLUSION*

BY J. LOWE YOUNG, D.D.S., NEW YORK CITY, NEW YORK

THE STANDARD DICTIONARY defines occlusion as follows: "The closing or shutting up of an opening, pore, passage or cavity." It is well for us to have this definition in mind when discussing occlusion of the teeth.

For convenience, the mouth may be divided into two chambers, the vestibule and the oral cavity proper. The vestibule is that portion of the mouth inside the lips not occupied by the tongue. The oral cavity proper is that space occupied by the tongue.

It is thought advisable to note step by step the part the teeth play in this closing or separating of the vestibule from the oral cavity proper.

The new born infant seldom has any teeth, but examination reveals the fact that the mouth is divided into two chambers as mentioned above, and that the upper and lower jaws, with their overlying soft parts, occlude or shut off the vestibule of the mouth from the oral cavity proper. (Fig. 1.) After the eruption of the first tooth, we find imperfect occlusion. This imperfect division or separating of the two portions of the mouth continues until sixteen of the twenty deciduous teeth are in full eruption. (Figs. 2, 3, 4 and 5.) These deciduous teeth are usually in approximate contact up to the time the second deciduous molars erupt and very often for a much longer period.

When the full complement of deciduous teeth is in full eruption, they serve to separate the vestibule from the oral cavity, and just in proportion as these are normal in form, and so placed as to form normal deciduous arches, do they make this separation complete. (Fig. 6.) It is the duty of every dental practitioner to impress upon that portion of his clientele, having young children under his care, the necessity of having their deciduous

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*Read before the Michigan State Dental Society, 1914

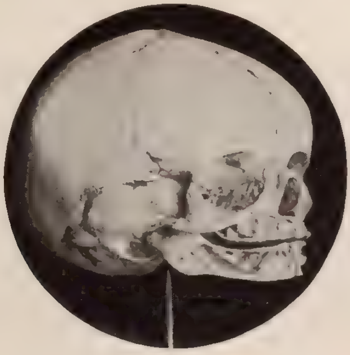


Fig. 1

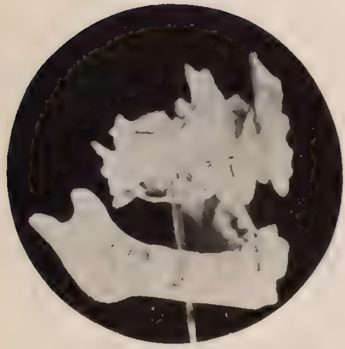


Fig. 2

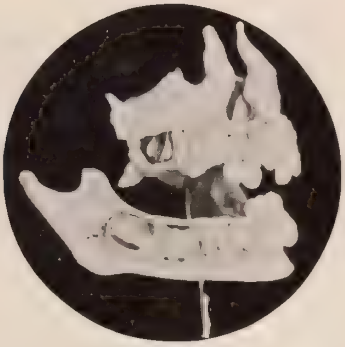


Fig. 3

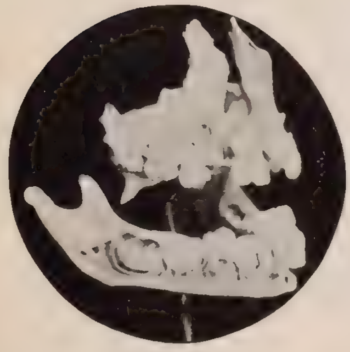


Fig. 4

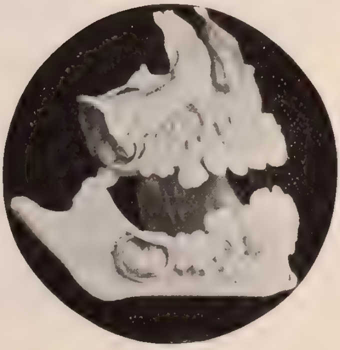


Fig. 5

teeth examined at frequent intervals and attended to when necessary. It is also the duty of every dentist to examine carefully each child that comes under his care to see if the deciduous dental arches are in proper shape and in correct relation to each other. Where found wrong in any marked degree, the earlier such cases are placed under treatment the better.

When the mesio-distal relations of the deciduous teeth are wrong, as in Class II., (Figs. 7 and 8) and Class III., Angle, they of necessity cause the improper locking of the first permanent molars when they erupt, and these molars in turn cause the improper locking of all the other buccal teeth. Lack of proper restoration of the mesio-distal diameters of the deciduous molars in filling operations, or the premature loss of one or more of these deciduous teeth, permitting the erupting first permanent molars to drift forward, will also prevent the normal locking of these important teeth. The dentist who is not prepared to properly treat these young children should see to it that they are placed under the care of one competent to handle such cases.

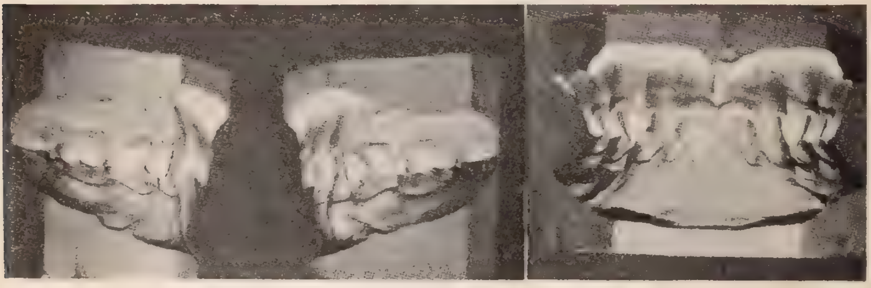
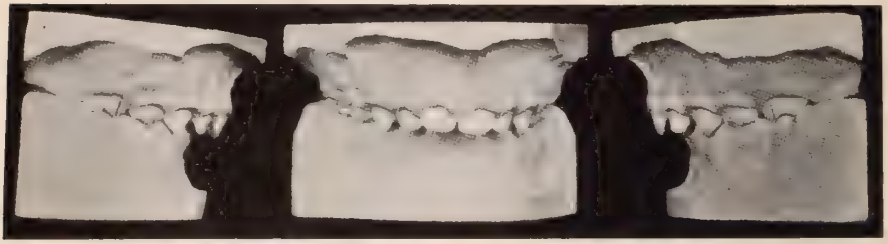


Fig. 6



Figs. 7 and 8

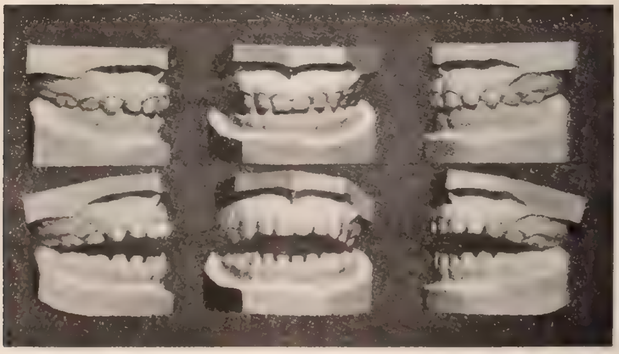


Fig. 10

Where normal development continues, from now on, we note a pronounced spacing of the deciduous incisors, both upper and lower (Fig. 10), and again imperfect separating of the vestibule from the oral cavity proper. This paradoxical arrangement should continue until all deciduous teeth are lost and their permanent successors are in full eruption. (Figs. 11-15.) After this stage of development has been reached, it is found and will be shown by means of slides and models, that just in proportion as the teeth are normal in form and position do they serve to separate the vestibule from the oral cavity proper, and that just in proportion as this separation is complete are the teeth of service for the purposes Nature intended them, the chief of which is mastication of food.

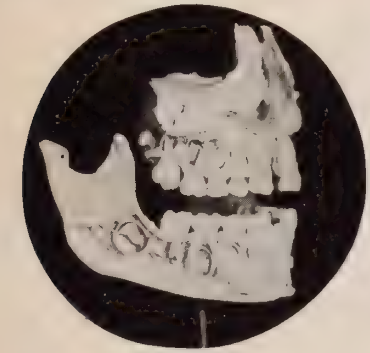


Fig. 11

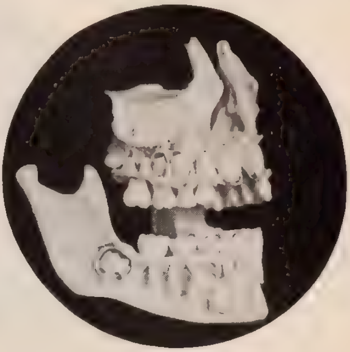


Fig. 12

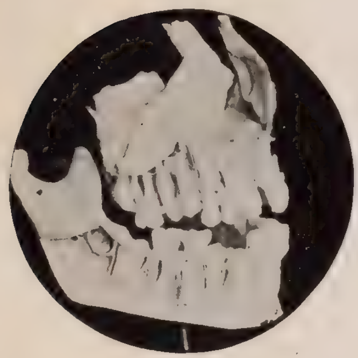


Fig. 13

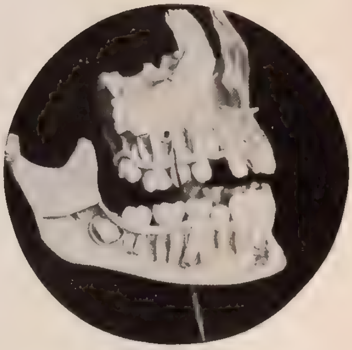


Fig. 14

The arrangement of the teeth shown in this picture (Fig. 16) is what is known as normal occlusion and, if carefully examined from every view, it will be observed that the teeth in each dental arch are in such relation to each other and to those in the opposing dental arch as to permit the most complete closing or shutting off of the oral cavity proper from the vestibule of the mouth. It is of the utmost importance that this normal relation of the teeth should be thoroughly understood by every dentist, for it is the foundation of real modern dentistry. The recognition of this normal relation by Dr. Edward H. Angle and his using it as a basis to determine all malocclusions placed orthodontia upon a scientific foundation, which fact mainly has enabled it to advance with such rapid strides during the last fifteen years.

For the orthodontist to correct malocclusion, he must of necessity have a clear and definite understanding of this ideal condition which he is attempting to restore. Thus it is that normal occlusion is the one supreme picture which the orthodontist has in mind, the beginning and the end of his anticipation of this treatment, the ideal which governs the daily progress of correction of malocclusion, the standard of occlusal relations which above all it is desirable to obtain. Fig. 17 is familiar to every orthodontist and should be to every practitioner of dentistry. Fig. 18 is made from the lingual view of the natural teeth in occlusion, and should also be most carefully studied and understood by all.

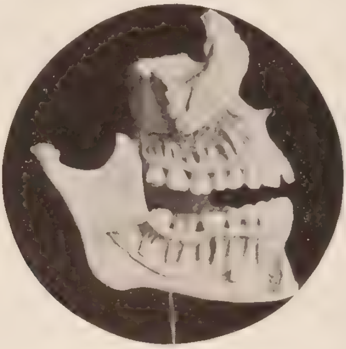


Fig. 15

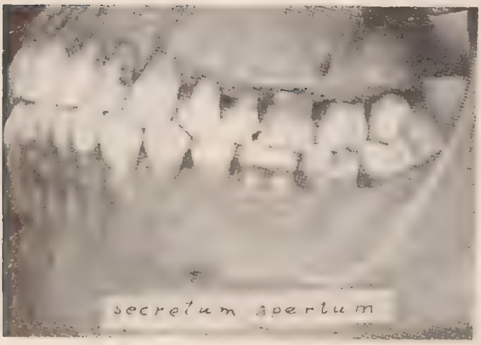


Fig. 16

Examined analytically, this condition of normal occlusion exhibits first, normal structure of the teeth, collectively and individually; and second, normal functions of the teeth, collectively and individually. Normal structure of the teeth will imply the perfection of form of the individual teeth and of each dental arch. Normal function will imply normal occlusal relations of the inclined planes of the cusps of the individual teeth.

With this conception of normal occlusion it will be apparent that the loss of one tooth, or even of one cusp of one tooth, or to be more exact, the loss of any portion of the mesio-distal diameter or the incline planes of their occlusal surface will to just that degree destroy both normal structure and normal function. It is also apparent to those who have seriously studied this question that it is of equal importance to properly restore the mesio-distal diameters of the deciduous molars when inserting fillings on their approximate surfaces.

Did it ever occur to you that the orthodontist often works for years to build up this normal occlusion, only to have it pulled down in a day by the ruthless extraction of a single tooth, or by the lack of restoration of cusp contour or normal depth of sulci and grooves or approximal contact in making fillings or inlays?

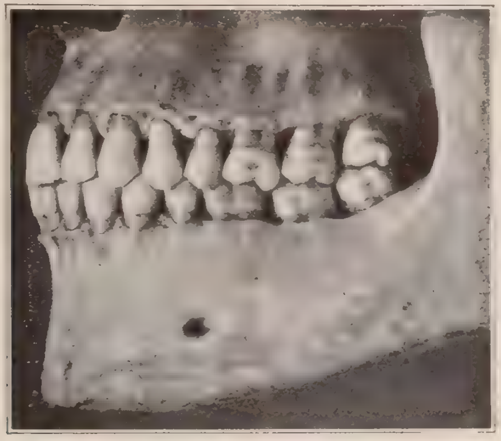


Fig. 17

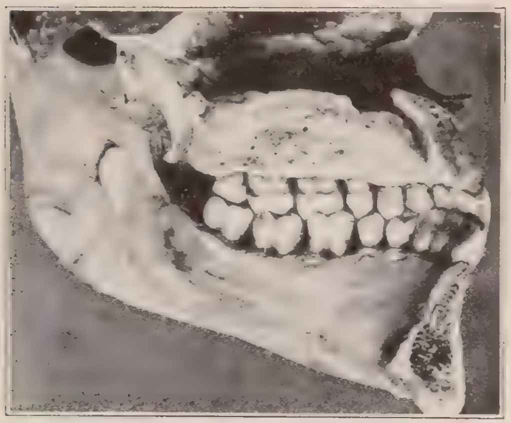


Fig. 18

It would seem, therefore, that the dentist must share the responsibility of the orthodontist in emphasizing the importance of normal occlusion by preserving it at all times, and at least, by not destroying it.

Hence, if the general practitioner is to properly restore any part of the dental apparatus he, like the orthodontist, must have in his mind's eye the forms, surfaces and positions of the dental organs when normal.

The value of approximal contact, the proper occlusion of each cusp, the size of each fossæ, the shape of each sulcus and the direction and depth of each groove, should be known to him who aspires to restore or recreate these anatomical forms.

It is my purpose to call your attention especially to the one phase of normal occlusion represented in the relation of the occluding surfaces of the teeth of one dental arch to the same surfaces of the teeth of the opposing arch.

At the same time I wish to appeal to you to use the same standard of normal occlusion as a guide in your work that the orthodontist uses, so that when you examine a set of plaster models, made from accurate plaster impressions, you will not only consider the teeth of one arch in their mesio-distal and bucco-lingual relation to those in the opposing arch, but that you will note the position of each cusp of each tooth and its relation to the cusps of the teeth of the opposing arch; for when carefully considered and thoroughly understood, their proper reproduction becomes of the utmost importance to the general practitioner and the prosthodontist as well as to the orthodontist.

It is my further purpose to direct your particular attention to the grooves, pits, ridges and the inclines found on the occluding surfaces of the teeth, and to consider the possibilities of their reproduction in your work. These features can be studied best from the natural teeth, wherever it is possible to procure a skull having all the teeth in normal occlusion.

Those of you who purpose to seriously study these organs will do well to have Doctor Black's "Dental Anatomy" along with your anatomical specimens. It is really wonderful how carefully each anatomical landmark is defined by this writer.

Great benefit may be derived by careful consideration of plaster models, made from accurate plaster impressions, such as the orthodontist is in the habit of making. Fig. 19 shows the occlusal view of such an upper cast. Fig. 20 shows the occlusal view of such a lower cast. By means of such models, the relation of the cusps, fossæ, sulci and ridges of the occluding surfaces of the teeth of the one arch to the same surfaces of the teeth of the opposing arch can be studied from the buccal, lingual and occlusal views.

Here let us note that the bottoms of the grooves, when normal, are never reached by the cusps of the teeth of the opposing jaw. In this respect the old-fashioned millstones were patterned after the grinding surfaces of the teeth, and whenever the miller allowed these stones to become dull, so that the grooves were very much reduced in depth, though not entirely obliterated, the grist was invariably spoiled. In like manner, whenever the dentist fails to reproduce the grooves, pits and ridges in restoring the lost portions of the occluding surfaces of the dental organs, he interferes with their efficiency for masticating food.

I again wish to refer to Figs. 19 and 20, and call your attention to one of the most important features of this entire question. If you will carefully examine these pictures you will observe on all of the bicuspids and molars, both upper and lower mesial and distal marginal ridges on their occlusal surfaces. Failure to reproduce these in fillings and inlays is a menace to the gum septum, regardless of how thoroughly the inlays or fillings may be formed to knuckle. Where the normal marginal ridges have not been lost by caries or abrasion and the teeth are in normal occlusal relations, any food particles forced between the teeth are readily deflected by the normal gum septum. Loss of these marginal ridges and especially where fillings and inlays are so formed as to make an inclined plane sloping towards the approximating tooth, tends to force coarse fibrous food portions between the teeth, and in a short time cause the breaking down of the normal gum septum, and in the judgment of the writer, is one of the great causes of interstitial gingivitis.

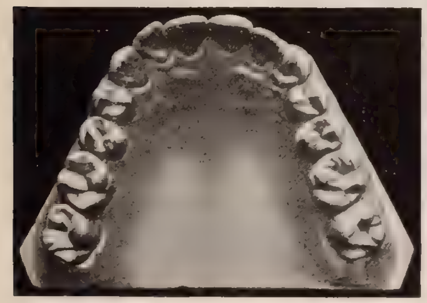


Fig. 19

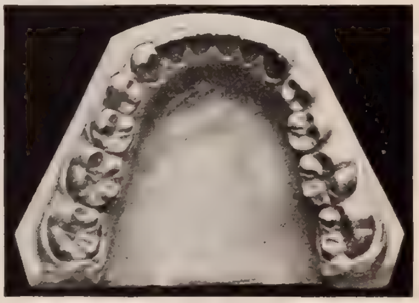


Fig. 20

It is not the intention to give you the impression that this question applies only to teeth in normal occlusion, for if such were the case, it would not be worth while imposing upon your time with such a paper; but, in order that you should be able to adapt your restorations to the best advantage in maloccluded and mutilated cases, it is of the utmost importance that you should first thoroughly understand normal occlusion. And if you find it exacting to reproduce portions of the occlusal surfaces of the teeth in your restorations where they are in normal occlusion, I am sure it will be a greater tax for you to make proper restorations in maloccluded and mutilated cases.

The question then naturally arises how to reproduce these anatomical landmarks found in the occlusal surfaces of the teeth when restoring portions or all of their occluding surfaces so that they will harmonize and properly occlude with the opposing teeth and not interfere with their efficiency.

Previous to the introduction of the cast gold inlay it seemed almost impossible and very improbable that this would ever be done. With the perfection of this process, it appears to be quite within the range of the careful, conscientious operator to so reproduce such anatomical landmarks in restoring any portion, or all, of the occlusal surface of a tooth, that detection of these restorations will be almost impossible, when examining plaster models made from accurate plaster impressions of such teeth.

Since writing the above, I have seen gold fillings from a few operators where the occlusal surfaces of the molars and bicuspids were reproduced so as not to interfere with their efficiency to any marked degree.

In the current number of *Items of Interest* for January is to be found an article by Dr. Wm. R. Pond, entitled, "A New Gospel and an Appeal for Higher Art in Amalgam Fillings." This article is well worthy of careful consideration. It has been my privilege to examine the plaster casts containing the specimen amalgam fillings shown in this article, and I wish to say that the restorations of the occlusal surfaces were as perfect as anything I ever have seen.

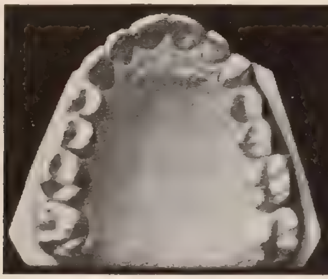


Fig. 21

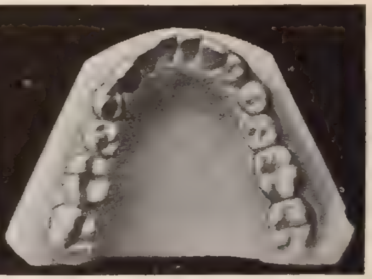


Fig. 23

I am aware that this paper is somewhat of a criticism on your efforts, and withal it is my desire to be fair in this matter. It is a little more than seven years since Dr. Wm. H. Taggart gave to the profession his wonderful technic in this work and it is not to be wondered at that, in adapting yourselves to this new method of practice and solving all the intricate problems which you have undoubtedly encountered, you were quite content when the occlusal surfaces of your inlays were equal to your best efforts when gold foil was used in making these restorations.

I wish to call your attention, however, to the fact that the specimen inlays which Doctor Taggart passed around at the January (1907) meeting showed beautiful cusp restoration and normal depth of fossæ. A porcelain-faced gold-shell crown that I have recently seen made by him many years ago, causes me to infer that it was largely due to his desire to reproduce the normal shape of the occlusal surfaces of the teeth that he was encouraged to persevere to the point where he developed this wonderful technic which he has given to the profession.

Now, with this picture of the normal occlusal surface in mind, let us, by way of contrast, consider the meager, inefficient manner in which the average practitioner attempts to reproduce them and see how far short he falls from the ideal in this respect.

A case that has been under my observation for a number of years for orthodontic work, and of which I have several sets of models, impressed upon me the probable mutual benefit of discussing this subject with you. Fig. 21 is made from the occlusal view of the upper cast of this case before any inlays were inserted. Fig. 22 is made from the occlusal view of the upper cast of this case after inlays were inserted. Fig. 23 is made from the occlusal view of the lower cast of this case before any inlays were inserted. Fig. 24 is made from the occlusal view of the lower cast of this case after inlays were inserted.

By studying the casts of this case, you will see by examining and comparing the occluding surfaces of the teeth before and after inlays were inserted how lacking these otherwise beautiful inlays are in the reproduction of the fossæ, sulci, grooves, pits and ridges necessary to make them conform to the teeth that have not been operated upon. You will observe almost flat surfaces and in many cases over contour on the occluding surface. In several places a malocclusion has been produced owing to the cusp of a tooth in one jaw striking too hard on an inlay in the opposing jaw. Indeed, it is a wonder that more teeth are not split where fillings and inlays are left in such a condition.

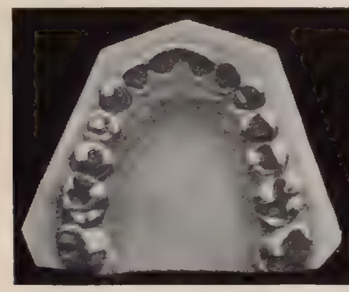


Fig. 22

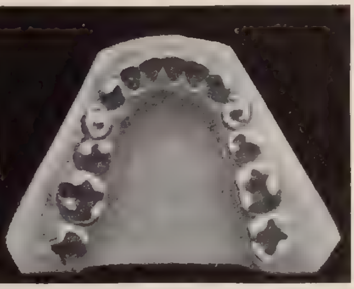


Fig. 24

That it is Nature's plan to have cusps of a proper length, and fossæ of a proper depth, and sulci of a certain form and ridges of a definite shape, in order to make the dental apparatus efficient, a careful study of these occlusal surfaces in their natural state will show conclusive proof. Figs. 25, 26, 27 and 28 inclusive, are made from skulls showing, first, the buccal view of the teeth occluded and, second, the occlusal view of the upper teeth. Please note when examining the buccal view how much the teeth have been worn and also how clearly the grooves are defined on the occlusal surfaces of these same teeth.

Fearing that you will accuse me of criticising your efforts without offering any solution to the problems involved, I am compelled to offer some suggestions as a remedy for these evils, and in doing so I am venturing on new ground, as I have never had any practical experience in making cast gold inlays.

I am not very familiar with the technic of this work, but I understand there are two methods employed, namely the direct and the impression method; but in either case *the occluding surface of the inlay should be made so as to accurately reproduce the natural shape of the tooth that it is to occupy, before it is cemented in place.*

That it is practical to reproduce in the wax pattern the exact shape desired and that the same can be cast in gold without losing the detail of this handiwork, a number of slides made from specimens will serve as proof. Fig. 29 shows a molar before a cavity was cut and Fig. 30 is the same tooth with a cast gold restoration in place. Fig. 31 shows an inlay just as it was removed from the flask, and that such an inlay without any polishing would be much more efficient than the best gold filling that was ever inserted, to me at least is incontrovertible.

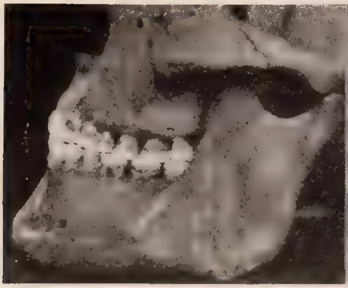


Fig. 25

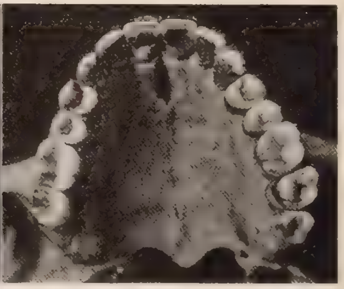


Fig. 26

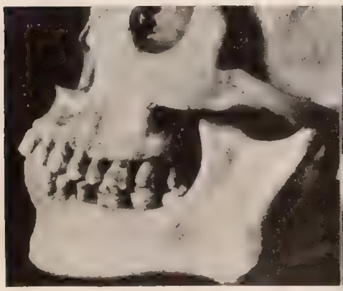


Fig. 27

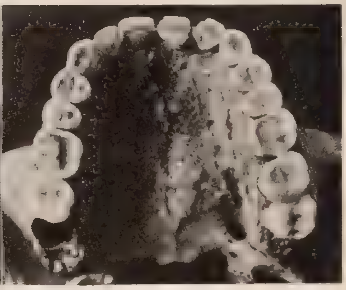


Fig. 28

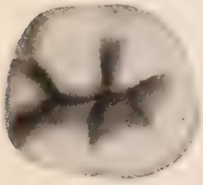


Fig. 29

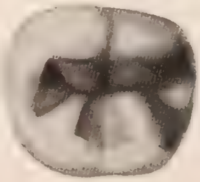


Fig. 30

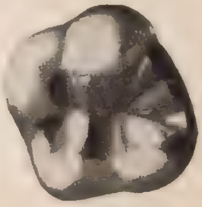


Fig. 31

Fig. 32 shows how the occlusal surface of the upper bicuspid inlays are frequently left. Fig. 33 shows how the surface should appear. Fig. 34

shows an occluso-buccal inlay in a lower molar as they are usually finished. Fig. 35 shows how it should have been. Fig. 36 shows the occlusal view of an upper cast. Fig. 37 is a reproduction of the left first molar in cast gold. Fig. 38 shows the occlusal view of an upper cast with three gold inlays. Compare that of the upper first bicuspid right side to those in the first molars.

When such restorations can be made by one who has had no practical experience, is it not obvious that the painstaking, conscientious operator who is making many inlays every day, can do much more artistic work?

The past year it has been my good fortune to see a number of practical cast gold inlays so formed that they reproduce the normal anatomical landmarks, to a much better degree than the specimens here shown, and I assure you that if you are not making these anatomical restorations that with practice and careful attention to minute details you will be surprised with your results.

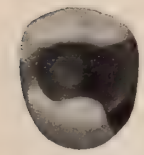


Fig. 32

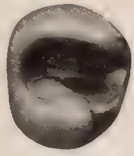


Fig. 33

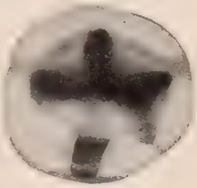


Fig. 34

For one who has had no practical experience in this work, to prepare such specimens it is obvious that the indirect method was used. The carving was done with suitable instruments. The sprue wire, which was very small, was placed on the under side of the wax so as not to obliterate the occlusal surface as reproduced in the wax. When cast, any imperfections on the occlusal surface, especially in the grooves and pits, were removed by means of suitable burnishers, for it must be borne in mind that if an attempt be made to smooth up the grooves and pits with burs or stones of any description, the result will invariably be an inlay with a groove with a round bottom. All such inlays are a constant source of annoyance, as certain kinds of food pack into them, and are difficult to remove.

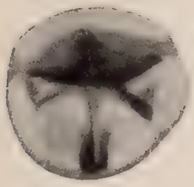


Fig. 35

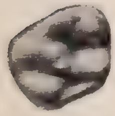


Fig. 37

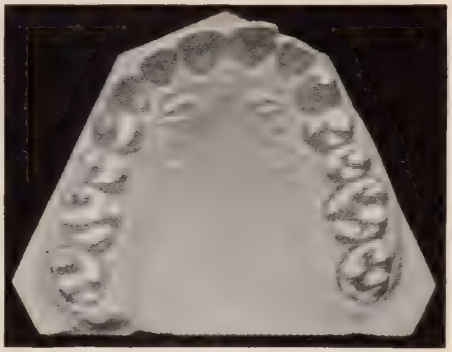


Fig. 36

One of the great difficulties experienced by the orthodontist is to retain the mesio-distal relation after it has been established. Very frequently this trouble is due to improper fillings or inlays, on the occluding surfaces of the teeth, particularly those of the lower first molars. If these restorations can be made so as to accurately reproduce the original shapes of these teeth, and thus permit the large mesio-lingual cusp of the upper first molar to properly seat itself each time the teeth are closed, do you not see what a powerful influence is exerted by the action of the incline planes of this cusp on the incline planes of the five cusps of the lower first molar, to prevent a return to a mesial or distal malocclusion, and do you not see that in a proportionate degree each reproduction of the normal occlusal surface of a tooth exerts a like helpful influence? Where all restorations accurately reproduce these anatomical landmarks, the orthodontist will experience much less difficulty in the retention of such cases.

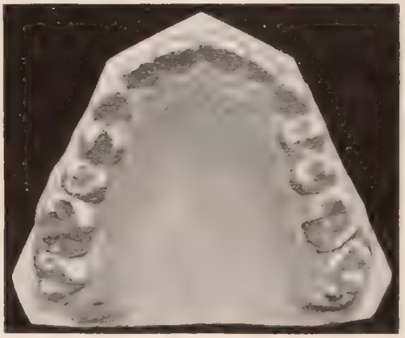


Fig. 38

Granting, then, that these occlusal restorations are possible, does it not appeal to you that they are necessary from the standpoint of beauty, perfection of anatomical contour, and especially of efficiency?

In presenting to you the keen appreciation of the orthodontist, of the importance of normal occlusion, it is with the hope of arousing a like appreciation in the dentist, so that in all his efforts at restoration of the lost parts of the dental apparatus he will be inspired to reproduce accurately in the minutest detail their anatomical shape. If I have succeeded in doing this, I shall feel well repaid and will look forward with keen interest to a heartier co-operation between the dentist and the orthodontist, in the attainment of normal occlusion.

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DISCUSSION

Dr. M. L. Ward: The essayist begins the treatment of the subject by pointing out that what is often called the oral cavity, mouth, etc., is in reality in two parts, viz.: a vestibule inside of which, through the process of proper exuviation of the primary dentition and a normal eruption of the secondary one, is developed the oral cavity proper.

He points out the evil results attending neglected cases of malocclusion in the primary dentition and emphasizes the dentist's duty in referring such cases to the orthodontist, and casually reminds us of our duty in maintaining proper mesio-distal relations in these teeth with properly contoured fillings.

In regard to the fillings in the proximate surfaces of the deciduous teeth, I will say that I trust that we may have in his closing discussion his opinion freely expressed relative to the use of materials that are more or less soluble in the oral media, and abraded by the process of mastication, for these fillings. It has been my observation that there was too general use of the cements for this purpose, and not a free enough use of amalgam and inlays to maintain the normal mesio-distal measurement of these teeth, and especially in cases where the arch was already too small.

He then points out the detrimental results that follow improperly preserved mesio-distal relations, and the premature loss of deciduous teeth, upon the proper locking of the first permanent molars, and the effect of improper locking of the first permanent molars upon the remainder of the secondary dentition; and concludes this sequence of valuable reminders for the practicing dentist with the statement that "just in proportion as the teeth are normal in form and position do they serve to separate the vestibule from the oral cavity proper, and just in proportion as this separation is complete are the teeth of service for the purpose Nature intended them, the chief of which is the mastication of food."

That he can bring forcibly to your attention the importance he places upon having the practicing dentist do his share in preserving the normal shapes of the teeth to make this separation of the oral cavity from the vestibule complete, he points you to the recognition of the subject by Dr. Angle, shows typical cases, describes occlusal relations of inclined planes of the cusps of teeth, and urges a close study of the subject as presented in Black's "Dental Anatomy."

In making these references he makes special mention of the cusps, fossæ, sulci and ridges found upon the occluding surfaces of the bicuspids and molars. He then makes an analogy of the occluding surfaces of these teeth and the old-fashioned millstones to show that perfect grinding is not done when the grooves do not exceed in depth the cusps of opposing teeth. He also states that it is his opinion that lack of marginal ridges is a great contributing factor in the cause of interstitial gingivitis.

Following the pointing out of the necessity for the proper restoration of the cusps, fossæ, sulci and marginal ridges, he mentions that previous to the introduction of the cast gold inlay "it seemed almost impossible and very improbable that this would ever be done."

From his remarks along this line it is plain that he is making a plea for what he considers a great advantage that the casting of fillings has over the other kinds of fillings, in carrying out better dental anatomy especially on the occlusal surfaces of the bicuspids and molars.

Those who have analyzed the changes that have been brought about in operative dentistry within the last seven or eight years will certainly agree with the essayist that his plea is in perfect harmony with the present great march that operative dentistry is making.

A trial of porcelain inlays forced the silicate cements; prophylaxis forced a closer study of the entire field of artificial substitutes with references to cleanliness; both the porcelain and gold inlay forced men to a realization of the problem of extension for relative prevention; successes in the treatment of pyorrhea and oral surgery generally have forced the medical profession and the public to value the services of the dentist more highly, etc., and now comes an orthodontist who wants us to make a greater effort in restoring the true function of the teeth.

If the suggesting of one improvement keeps on suggesting others, I fear we will have a pretty lively race in keeping up to the times.

We may say, however, the suggestions of the essayist are fundamental to the practice of operative dentistry, but I hear some of the specialists say, so is prophylaxis, and another that extension for prevention is fundamental, and others that the various phases of oral surgery are fundamental, etc.; but I cannot conceive of anything being more fundamental, all things considered, than a knowledge of dental anatomy.

I know a great many think that they know dental anatomy pretty well and that a movement to improve it is hardly necessary at this time. If any one had told me, one year ago, that I did not know my dental anatomy as I should, and that I was not observing some of nature's principal markings upon the teeth, let alone a study of the function of many of these markings, I probably would have resented it quite emphatically, while if the same were said to me today I would probably say that I am *just beginning* a study of the subject.

I say beginning, because within the last year a similar paper by Doctor Young and a couple of visits to a city that, in my opinion, has more enthusiasts over the proper amount of contour and its location than any other in this country, has brought to my attention so many things that I had been overlooking.

Those of you who followed the paper that Doctor Young gave before the Second District Dental Society of New York, and published in *Items of Interest*, last May, and the discussions that followed in the October, November and December numbers by Dr. C. Edmund Kells, J. Lowe Young, R. Ottolengui, Henry Gillett and Alfred S. Walker, have before you the spectacle of four "New Yorkers" trying to show a southern man of repute that he too had been overlooking some things about dental anatomy. From my own experience and that of Doctor Young, as presented in *Items*, I shall not be surprised to hear many here saying, as Doctor Kells did, that they do not believe that the "Revolutionary Ideas" presented in Doctor Young's paper and recommended by Doctor Ottolengui will ever materialize.

Much as they have been revolutionary to me and much as I am in harmony with the movement for better dental anatomy, both in cusps for teeth and contours for crowns, I admit that I doubt if the movement is ever realized to the extent that is suggested by Doctor Ottolengui in the same number of *Items* as Doctor Young's New York paper.

There can, in my opinion, be *no question* about the value of a *movement of this kind* to almost every department of dentistry even if it is found that the execution of it is limited to those practices that demand the highest attainments in art, but to imply as Doctor Ottolengui did in his editorial that "Doctor Young's New York paper made this kind of work obligatory upon every conscientious operator," and that the gold foil filling would be superseded by the gold inlay as fast as the profession could be educated up to its duty, is an injustice to the men whose practices will not permit of such a degree of art being carried out. And I repeat that this work that Doctor Young suggests is art of the highest order. If you do not realize it now, you will after you have done a few restorations like his.

And, for a man like Doctor Ottolengui, with a great journal in his hands, to foster a campaign in favor of the gold inlay, on the basis of Doctor Young's suggestion that better cusps can be made with this form of filling, to the exclusion of not only gold foil but any of the other filling materials is the worst kind of injustice to the students of operative dentistry in this country, who are devoting their energies towards finding out what constitutes art in the different filling operations and the placing of the material that seems to carry with it the highest degree of art.

For example, if within the next year or two the manufacturers should improve the silicate cements so that they were the equal of the porcelain filling in esthetic qualities and be as strong as concrete, don't you think that the gold inlay would be rapidly cut down in numbers, even if it could not be carved up to make cusps as near anatomically correct as could the inlay?

In other words, which is the highest art, which is the nearest correct—to have the shape of the cusps a little nearer right on one, or the color many times better on the other, when both can be so made as not to impair efficiency to a marked degree?

Doctor Young makes the statement, I am glad to say, that "he has recently seen gold fillings from a few operators where the occlusal surfaces of the molars and bicuspids were reproduced so as not to interfere with their efficiency to any marked degree," and later in the paper refers to Dr. Wm. H. Pond's paper in the January number of *Items*, under the title, "A New Gospel and an Appeal for Higher Art in Amalgam Fillings." He also says that it has been his privilege to examine the plaster casts containing the specimen amalgam fillings shown in the article by Doctor Pond, and he wishes to say that the restorations of the occlusal surfaces were as perfect as anything he has ever seen.

I am sure that this admission by Doctor Young that he has seen both gold and amalgam fillings in occlusal surfaces that did not impair their efficiency to a marked degree is much more in harmony with the reputation he had as a gold worker and all around dentist when he lived in Detroit, than is the over-zealous statement of Doctor Ottolengui in May *Items* that "contourists have *replaced corners*, have built up *incisal edges* with fair accuracy, and they have *even* rounded out the approximal or circumferential shapes of teeth, but they have *woefully failed to even fairly well imitate* the occlusal surfaces of bicuspids and molars."

I admit that I have never seen many who made fillings that had occlusal surfaces that were very near to the standard set up by Doctor Young out of gold, amalgam, porcelain, silicates or even the gold inlay, but I am not willing to admit that many fillings cannot be made with many of these materials that are not as good as the ones Doctor Young saw, and which he admits did not interfere with their efficiency to a marked degree.

In short, I do not believe that this movement for better occluding surfaces of teeth, and dental anatomy in general, should have connected with it any particular filling material if it is to be a country-wide movement, because there are first, hundreds of men today who cannot make gold inlays that are as artistic, all things considered, as their other fillings; and second, because the man who sees art and ideals in only one material and limits his operations to one kind of material, is not doing his patients the service that the man is who is a genius in the use of the different materials and can see art in a beautiful porcelain inlay, even if it does not have as deep sulci as a gold inlay; and third, because the advantages of some of the other materials in certain locations in the mouth are of far more importance to some men than the difference between the depth of sulci in the gold inlay and the other materials.

To urge better occluding surfaces and leave it to the dentists to use what they choose, will, in my opinion, bring far better results than to urge the gold inlay, and better occluding surfaces at the same time.

The title of the paper that Doctor Young presented in New York was, "Restoration of Occlusion by the Casting Process," while this one along the same line is entitled, "Occlusal Restorations," the former implying restorations by one method and the latter by several methods.

Thus it seems that Doctor Young has observed that the advantage of the gold inlay in regard to better occlusal restorations has had its effect upon improving other materials in this respect. The gold inlay seems to have improved the gold filling, and probably some of the others. If this is the case, why does Doctor Ottolengui prophesy the passing of the gold foil filling and carry on the campaign that he now is with a reward for the best gold inlay? Why does he not offer a reward for the best filling regardless of its kind, if he has the interests of better occlusion in mind, and does not want us to interpret his campaign to mean that he recognizes only one filling material for bicuspids and molars?

The gold inlay may be the means through which this very important subject can be brought forcibly enough to the attention of the profession to get results, but I see no reason why it should be advocated to the exclusion of any of the other materials until the total skill of the operative dentists of this country have given us a verdict in its favor.

To do otherwise is to shake the very foundations upon which operative dentistry is builded. The gold and porcelain inlays have probably improved the laying out of cavities beyond the comprehension of the average dentist. In fact, many dentists are unconsciously laying out his cavities on better lines than he formerly did for other materials, but I have failed to find one who considers this sufficient reason for the adoption of the gold inlay and the prophecy of the passing of any of the other materials. The most of them, if not all, are here to stay, though I admit that the numbers of some of them are likely to be cut down, and probably should be; and the question before us is, "*Can we meet the high standard that these close students of occlusion set up in some of our cases and make the others acceptable?*"

I think we can, and I do not think we need to increase the number of gold inlays to do it, either.

In my attempts to find out how to best get at the thing I find three things that stand out conspicuously in the way: first, dentists generally do not know the function and forms of cusps as well as the orthodontists do; second, dentists generally have not learned to cut the step portion of proximal cavities either wide or deep enough to permit the carving of an anatomical occlusal surface; and third, they have not yet learned the technic of either carving or finishing occlusal surfaces that are anatomically correct.

DR. THOMSON: It was my pleasure about a year ago to visit the essayist in the evening at his office, and some of you may know that Young and I were pretty good friends when he was here in the city. He hadn't any bad friends. He had no sooner inquired after my general health than he said, "How do you carve your wax inlays—your wax patterns?" I said, "With a spoon excavator." He said, "You can't do it." To make a long story short, he went over to his cabinet and called my bluff, and brought me an amalgam model, and a spoon excavator, and said, "Go ahead." I talked to him about everything else while I was doing that, and I finally handed the pattern back to him, and he said, "You have made a pretty good attempt." I said, "Do you realize as much as I do, since I have started in on this thing, that the most important part of this carving is the marginal ridge?" He said, "That is the best thing you have said yet." And I am frank to confess that up to the time Doctor Young gave me this stunt to do, some of the importance of the carving had not occurred to me, and it started me on a line that I have tried to follow out since. Doctor Ward has said something that is true, that it is almost impossible to follow out these lines, and polish and finish up to the ideal that Doctor Young has cited in his paper, and which he would have us carry out. I saw the models he showed in his office, and it was an eye-opener to me. Since my associate and myself have been striving to carry out this idea, we have had more good things said in regard to our operative work, as to inlays and amalgam work, than we ever had before, and we have tried to avoid the incline plane toward the proximal surface, and have in its place given the proper attention to the marginal ridge, and have had fewer people complaining of food crowding down between the teeth, and we have stopped making crushers; we are making grinders.

DR. YOUNG (closing): There is very little for me to say in closing. Doctor Ward mentioned and criticised the use of cement on the proximal surface of deciduous teeth. From my observation of children in my practice, I would say that cement on the proximal surface of deciduous teeth is a poor filling material. It would be much better to use gutta percha, which tends to spread the teeth apart a little rather than cement that is gradually washed out and allowing the teeth to come together.

Doctor Ward has admitted that it is next to impossible to get as good occlusal restorations with other materials as with cast gold inlays, but contends that the use of gold inlays has been entirely overdone. With this I agree. I realize that every operator cannot put in gold inlays, as many people cannot afford to pay for them and here let me say I want you to see the models I have brought along, loaned to me by Doctor Pond, showing amalgam fillings so carved as to most beautifully restore the occlusal surface of the teeth. If these fillings will remain in the shape we now see them, I cannot see why they would not be as efficient as gold inlays.

Efficiency should be the aim of all restorations and the operator should study and determine with what material he can make the most efficient restoration and use it, whether it be amalgam or cast gold inlay or porcelain.

It is doubtful in my judgment if as efficient restorations can be made with porcelain as with the other two materials, but if you can do it, I would say it were much better than either of them because it is more esthetic.

I want to emphasize one point, and that is the mistake many make in restoring the occlusal surface of the upper bicuspids. The cusps of these teeth are always separated by a deep sulcus, the bottom of which is a "V" shape groove.

I have never seen one having a ridge connecting the buccal and lingual cusps.

PARTIAL DENTURES*

BY F. EWING ROACH, D.D.S., CHICAGO, ILLINOIS

I REALIZE IN COMING BEFORE YOU this afternoon to give a lecture on Prosthetic Dentistry, that I am introducing a subject that the majority of the profession, unfortunately, are not overly enthusiastic about. I want to call your attention incidentally, however, to the fact that in prosthetic procedures we are responsible for the conservation, insofar as it is possible, of the natural teeth and the healthful condition of the people who come to us for dental service. I believe the dental laboratory is capable of doing good partial denture work—that it is capable of doing the work entirely satisfactory, provided we do our part as we should. We are in the spotlight, and are being held responsible, apparently, for all the ills that mankind is heir to, and while I believe this thing is being exaggerated considerably, there is undoubtedly much of truth in the fact that we *are* responsible to some degree for the unhealthy condition of our people.

In considering the subject I shall direct your attention particularly to that part known as partial plates or removable partial dentures. Of course the term "Partial Dentures" would include all forms of bridge work, fixed, removable and partial plate work. If we are going to make partial plates or partial removable dentures that will be successful, and minimize the destructive tendencies to the natural teeth while being worn, we must pay more attention to the details of construction and make them more accurately than we have in the past.

Let us not do what is being done a great deal, take an impression of the mouth in beeswax or modelling compound in an indifferent way, and send that impression to the dental laboratory and expect to have constructed and returned to us a denture that will meet the requirements. This is asking too much of the laboratory man. Let us, then, try to improve on our impression taking. I believe most of the impressions for partial dentures should be taken with plaster of Paris. I realize good impressions can be taken in modelling compound, but I believe the majority of them should be taken in plaster of Paris and removed in sections. This means a liberal sized impression tray, large enough to encompass the mouth and teeth, and contain sufficient bulk of plaster to make it possible to break it out in large sections which can be easily put together. This subject is important, and if I can impress upon your minds the necessity of a greater interest in the construction of these pieces, and in the conservation of the remaining natural teeth, I shall be glad. Conservation is in the air, so let us do our work with this great principle ever in mind.

To construct a correct partial denture, after we have decided on the kind of appliance, the first thing necessary is a correct impression.

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*A lecture given before the Indiana State Dental Society, 1914.

In slide No. 1 is shown a plaster impression from which we obtain a correct model and in this connection I wish to say that all models intended for partial plate construction should be made of a material harder than plaster of Paris. Particularly is this true of the reproduction of the teeth to which clasps are to be fitted. For this purpose you may use either a slow-setting cement or a material which is known as Modelite. This material should be mixed to a stiff putty consistency, rolled into a cone between the fingers and packed into the impression of the teeth to be clasped. A wood screw is then pressed into the material while it is yet plastic, after having allowed a few minutes for the hardening of the Modelite or cement' The rest of the model may be made of plaster of Paris.

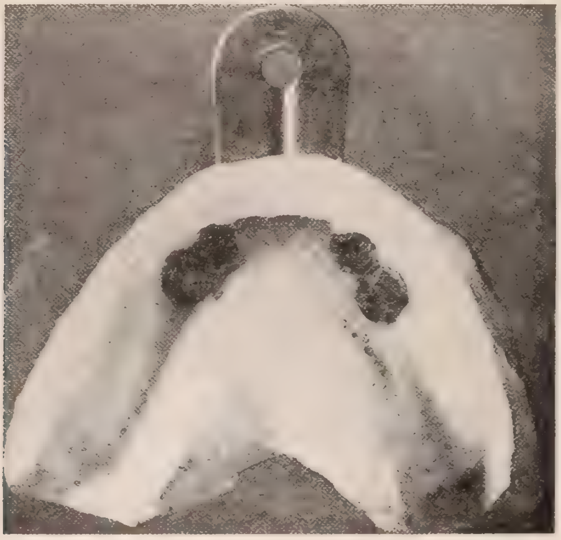

Fig. 1

Fig. 1—Plaster impression showing Modelite packed in impression of teeth to be clasped and screws set preparatory to pouring the plaster cast. .

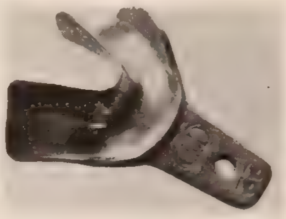

Fig. 2

In slide No. 2 is shown a new design of impression tray, known as S. S. W. No. 30. It is practically a universal tray for taking lower partials.

Slide No. 3 shows a model with the modelite reproduction of the teeth, and the plate outline for the metal lingual bar we use in lower plate construction. It also shows the two forms of loop clasps, one open loop and the other a continuous loop. Both terminals are secured to the denture. The continuous loop clasp is indicated for straight sided teeth, the open loop for bell-shaped teeth.

For the lingual connecting bar for partial lower, I prefer the round clasp gold wire about 12 gauge. This form of lingual bar is the strongest, the least in the way of the tongue and more easily fitted than any other form. Care should be taken not to fit the wire too close to the model—it should be set away from the model about 1-16 of an inch.

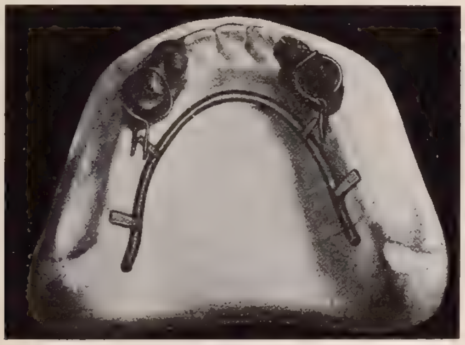

Fig. 3

Fig. 3—Plaster cast showing Modelite reproduction of teeth to be clasped. Continuous loop clasp on left bicuspid and open loop clasp on right cuspid. Also proper position of lingual bar and upright spurs for vulcanite attachment.

These vertical rectangular spurs which are soldered to the terminal of the connecting bar are intended for the attachment of the vulcanite.

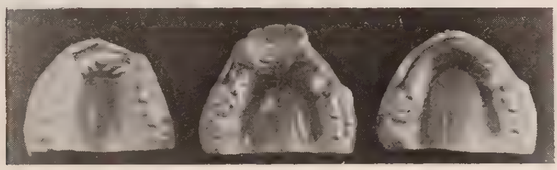

Fig. 4

In slide No. 4 is shown a few plate outlines that illustrate the points previously referred to with reference to contact of plate with the remaining natural teeth. Our efforts should at all times be to reduce the contact of the plate with the natural teeth.

In slide No. 6 is shown the various steps in the construction of a new form of clasp, which we will for convenience call the Wire Loop Clasp. My experience with wire clasps is that they are more efficient, less injurious to the teeth to which they are attached and less conspicuous. We form the wire into two kinds of clasps, the open and continuous loop. The continuous loop completely encircles the tooth and both terminals are fastened to the denture. The open loop has one end free and the other fastened to the denture. In forming these clasps, Bernard's parallel jaw pliers, Nos. 107, 104 and 201 (as shown) will be found most suitable.

In the continuous loop clasp we find 20 gauge clasp gold wire is sufficient for strength; in the open loop 18 gauge should generally be used.

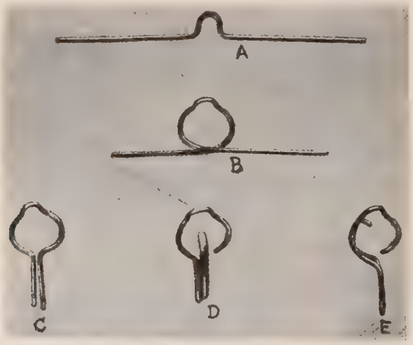

Fig. 6

Fig. 6—Showing formation steps and three types of completed loop clasps.

In the construction of these clasps it is important to observe a few points, namely, that the wire as it comes from the dealer must be annealed, so that in making sharp bends it will not break. Always bend the wire over the round-nosed pliers. And in soldering, precautions should be taken to invest it. Although you may not burn the wire, you are likely to, and if you invest them you will find the integrity of the wire is better conserved in soldering. Always keep the clasp on the enamel. Most injuries to the gum by clasps have been brought about by permitting them to rest on the tooth below the enamel. In all forms of clasps, we should have some

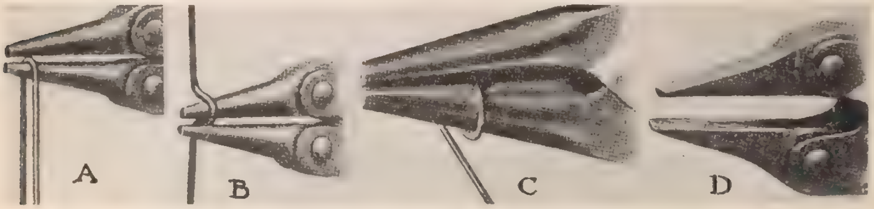

Fig. 7

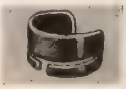

Fig. 8

Fig. 8—Royce clasp. An improved form of band clasp. The gingival slits greatly increase the flexibility, adaptability and efficiency of the band form of clasp.

form of occlusal rest, so that while being worn they will not settle down from their proper relation to the tooth, and thus create injury to the gum.

Slide No. 8 shows a new form of band clasp. It is but a modification of the old type. The particular feature is that in the lower part of the clasp a slit is made longitudinally, and then it goes out vertically. The lower part is for the subsequent adaptation below the bell of the tooth.

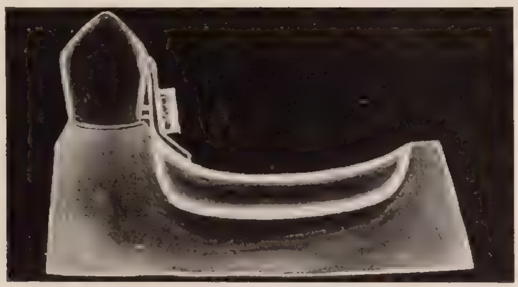

Fig. 9

In the use of the ball and socket attachment, shown in Slide No. 9, the mistake is made of not having a contact bearing to the teeth to which they are attached. If this is not made it will settle and the plate will not be held in position as well as it should be.

In slide No. 10 we show the double bow clasp. In many mouths we find a place where one or two teeth have been lost and there are sound teeth on both sides of the space. I have always avoided mutilating these teeth, feeling I was doing my patient better service to leave the space open rather than to try to do something that would perhaps cause more harm than good. Of late years I have been making this double bow clasp. There are many modifications, and if made properly, and advantage taken of the contour, etc., you can obtain very good results and avoid the mutilation of the other teeth. There is nothing that may occur in the mouth that may be the cause of greater damage than the loss of a single tooth. When a tooth is lost, almost invariably there is a shifting of the other teeth and a loss of proper occlusion. Here is another simple appliance for that single tooth.

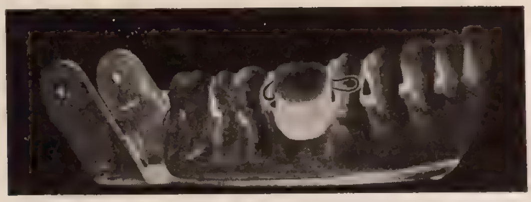

Fig. 10

DISCUSSION

Dr. Frederick R. Henshaw: I am satisfied, and it is not necessary for me to add any opinions of my own, for my opinions on the matter that has been discussed this afternoon have been very largely formed by Doctor Roach. My observation of his work has covered a period of a good many years. Doctor Roach always presents the very last word on everything. When you have listened to one of his lectures, you always get something that has been scientifically tested, and you will also hear something that is thoroughly reliable. I have used several of the things he has advocated for many years, and I have found that his investigations and methods and system have been worked out so well and scientifically that it is almost perfect. The meat of this nut that we have had this afternoon is the idea that Doctor Roach has, the desirability of avoiding the mutilation or possible destruction of the adjoining teeth in cases like those he last showed, for instance, the loss of first molar. It is certainly desirable not to bring about the mutilation of the adjoining teeth. The method of wire clasps which Doctor Roach has shown us makes it possible to restore those teeth, and restore them in a useful and proper manner, without destruction. The first wire clasp which Doctor Roach showed cannot help but appeal to all of us who have faced that undesirable thing of having to mutilate a tooth as a means of support for any sort of restoration. Those cases we find most difficult are the ones he represented in his slides, where the loss of the masticating teeth in the lower jaw has presented itself. By means of the design of clasp Doctor Roach has given us, it is possible to make restorations entirely practical and substantial, restoring the loss of masticatory surfaces, and at the same time relieves us of the necessity of the mutilation of any of those adjoining teeth. The method he has described has been worked out from a scientific and practical standpoint; he has shown us how it is possible practically to make a correct model, a model which can be utilized as the means to adapt and adjust this appliance, and then further utilized as a means of vulcanization, or, if necessary, soldering. By the use of the hard substance, Modelite, of which the first approximating tooth is constructed in the model, it is possible to bend and adjust the clasp in such a way that you have absolute and perfect accuracy, so that when your completed product is ready for the mouth, you know you have perfect adaptation, and that you have something that is going to hold and give service, and at the same time you have avoided the lamentable thing of destroying or mutilating a tooth. The longer most of us are in the practice the more loath we are to deliberately and without consideration destroy or mutilate a tooth. It is not well to devitalize a sound tooth, and take chances on the things that may happen. I firmly believe Doctor Roach has given us a method that will be of vast benefit to the profession and of far greater service to the public, who are going to use it. I am very glad to have heard this paper. I always follow what the author does with much satisfaction to myself, and I can recommend his work to you all.

Dr. Torsch: It is not wise to let so good a lecture on "Partial Dentures" go undiscussed, and since I had the privilege of being in Chicago during the big meeting there and heard a description given of the wire clasp, I feel I would be ungrateful to Doctor Roach if I did not say something in regard to it; not that it requires any word or any addition or statement from me, but simply because it has already afforded me a pleasure, and one of my patients at least a good service, in placing restoration in her mouth with the wire clasp. Immediately on my return from Chicago I had a case where two lower bicuspids had to be clasped for a lower partial denture, and this enabled me to render my patient a good service, and at the same time repaid me as much more for the service that I rendered as my railroad fare cost from Louisville to Chicago, because I was able to collect a better fee for that particular denture than I ever could for work that looked like it, and besides eliminated the old clasp, which was unsatisfactory and unsanitary from every standpoint. I did not have the full equipment of pliers that Doctor Roach showed. I usually have round and flat pliers for this purpose, and with them I constructed these clasps. I also constructed a full set of them for one of my brothers who wanted to give a clinic with them. I want to call attention to one feature of the clasp, the open wire clasp, I think you call it.

Insofar as I use the lingual extremity, I fold over and bring back and abut it against the tooth in the horizontal fashion, so that I have an envelopment of the tooth with that clasp. Not only do I have the bar extending over the contact point on the mesial surface, but I have the horizontal bar of the lingual extremity abutting against the tooth itself, which gives an added support, and I believe Doctor Roach will also agree with me if I say in such cases it will be still better, if we have the room and it does not interfere with the articulation of the occluding teeth, if we make a lug of that. Doctor Roach has said that the possibilities have not all been exhausted, and we may find other applications of it than have been given by Doctor Roach. I want to thank the Indiana State Society for having Doctor Roach here, and also for letting me come so that I might have the benefit of this very able lecture at this time.

Dr. E. W. Ream: The thing that particularly interested me was that it is a system of replacement that retains the health of the mouth. This is an oral hygiene day and everyone is interested in that particular phase of dentistry. I could not help but think when Doctor Roach was explaining the technic of construction of the appliance that in a case of loss which indicates its use has gone for some time, the teeth remaining take an inclined position producing malocclusion and a pathological tissue with the establishment of pyorrhea and its consequent systemic infections and derangements.

Dr. A. M. Nodine, of New York, says: "The staphylococcus and streptococcus find their way to the blood and lymph by five routes: first, from the immediate focal point of infection; second, through the mucous membrane of the mouth whose resistance has been broken down; third, through the tonsils and crypts; fourth, through the stomach and intestines, and fifth, the infection may be drawn into the bronchi and find its way to the blood stream."

In a normal blood count there should be to every 7000 white corpuscles 5,000,000 red. I recently had a letter from Dr. William Hunter of the London Charing Cross Hospital, stating that for 25 years he had been making investigations along the line of mouth sepsis, and that it was a fact that these bacteria reduced the red corpuscle count, being a direct cause for anemia in its various forms and stages.

When a man comes to us with such superb mechanical skill that he can forestall the establishment of such pathological conditions and prevent our patients from acquiring systemic disturbances, we owe him a vote of thanks.

Dr. Prow: I am very much interested in the appliances Doctor Roach has shown us today. I had the pleasure of seeing them in Chicago. It appeals to me, any appliance which will relieve the teeth remaining in the mouth, after some are lost, and that will so conserve the tissues and teeth that they will not be in any way injured, is a wonderful blessing to the patients, and the wire clasp he shows us I think is the best one we have ever had. I have been the user of the Gilmore attachment and the Morgan System, and have not used Doctor Roach's, but I think the use of any appliance, of whatsoever nature, that will produce the least possible friction, is to be desired. It does seem to me that the gold wire made as he has shown us is very fine, especially in the clasping of a cuspid tooth. One feature that was not dwelt on particularly was the placing of this Modelite. The essayist places a screw in it to give it solidity. That is a wonderful help. The lingual bar is also a step in the right direction.

Dr. Roach (closing): There isn't much for me to say other than to express my appreciation of the many kind words that were spoken. I was in hopes some would dissent. But I appreciate the fact that you haven't said anything that really occasions any reply upon my part. I want just to emphasize again, and if possible, summarize in a few words, what I have been endeavoring to convey to you in my talk this afternoon. I am exceedingly interested and enthusiastic in these prosthetic procedures and in the importance of them, and I do feel that there is a lack of appreciation on the part of the profession of the importance of prosthetic dentistry generally, and for that reason I want to make an appeal at this time for a renewal of your personal interest in this work. An investigation I made, since taking special interest in this work, and the responsibility leaded upon us in the care of our patients' mouths, took me into some of the laboratories of Chicago, where I observed the difficulties they had to encounter with the impressions sent to them to make partial dentures from. It was really a great surprise; beeswax and modeling compound impressions seemed to be sent in in a very indifferent way. Let us see if we cannot improve on them. I want to make an appeal for better impressions being sent to the laboratories. The laboratories can do the work, but let us send them good impressions. And, if possible, let us bear our share of the responsibility that we have in maintaining a healthy condition in the mouths of our patients. There is one word about this new form of clasp I want to say. It is new; I have only used it for a year. You may find it rather difficult to make. Do not be discouraged; I have spent hours at a time fitting one of those clasps. I can make almost any of them now in ten or fifteen minutes. We learn to do any new thing by doing it over and over again, until by practice and experience we become proficient. Make your models right, and make them so you can make a dozen if necessary, until you get your hand in. The little wire clasp I have shown you for clasping cuspid teeth, is one of the best clasps ever designed, I believe, for a cuspid tooth. It is the only clasp I have had anything to do with that was really efficient as a clasp for a cuspid. It grips the tooth mesio-distally, rather than labio-lingually, which is a decided advantage.

I want to thank you for your patience in listening to what I have had to say on this subject.

RECOGNITION OF DISEASES OF THE SOFT TISSUES AND OF FOCI OF INFECTION ABOUT ROOTS*

BY J. P. BUCKLEY, PH. G., M.D., D.D.S., CHICAGO, ILL.

I AM GOING TO ENDEAVOR to do two things, and I want briefly to call attention to two phases of dentistry from the so-called medical or therapeutic aspect, which I think has been neglected by the average dentist; two phases toward which we must direct our attention more in the future than we have in the past. One is the recognition of the diseases of the soft tissues of the mouth, and the other is the recognition of foci of infection about tooth roots. The mouth is an incubator and hot-bed for all kinds of bacteria; and many systemic diseases have their origin there, or in the germs that are propagated or developed there. One of the things that the dentist (it matters not whether he ever expects to treat those things or not) should be able to do is to recognize the early manifestations of that disease, which is called a specific disease, syphilis.

Syphilis manifests itself in and about the tissues of the mouth. It is a chronic infectious disease, now known to be produced by specific micro-organisms discovered in 1905 by Slauden and Hoffman. Before that time we didn't pay much attention to the treatment of the so-called primary symptoms of syphilis. From the therapeutic standpoint we neglected those symptoms, or ignored them until the manifestation of the secondary symptoms. Primary and secondary syphilis is manifested in and about the mouth. The typical primary manifestations are known as hard

*A lecture given before the Indiana State Dental Society, 1914.

chancres. These occur all the way from three to six weeks after infection. In order that this chancre may develop it is necessary that there be a break in the oral mucous membrane, and that the germ productive of this disease come in direct contact with that break. These chancres are nearly always single; very seldom do we see two. They appear soon after infection, and they begin to slough in the center. We have a crater-like opening from which comes a discharge that is extremely infectious.

Before the introduction or discovery of Salvarsan, a new specific for syphilis, the primary symptoms were ignored, because there was no way to diagnose the condition before the introduction of the Wasserman test, and before we knew that the condition was caused by this specific germ, and for fear of wrongfully accusing an individual of having this disease, the disease was allowed to go until the manifestation of the secondary symptoms.

I am not going into the method or technic of injecting salvarsan in connection with this disease, because that is a treatment that could be relegated to the family specialist. It is interesting to know that this specific for syphilis, "606," salvarsan, is a compound of arsenic, and not of mercury. Mercury has for years been known as a specific for secondary symptoms of this disease, and those of us familiar with that fact, unless we know the reasons why (which are understood and explained by the men who discovered this specific) are somewhat startled to know that the latest specific is a compound of arsenic and not of mercury.

The secondary manifestation of the disease occurs all the way from four to six or eight weeks, after the development of the hard chancre. The symptoms of secondary syphilis usually are an eruption on the skin, frequently on the oral mucous membrane, and frequently after those eruptions, which, by the way, are not characteristic of the disease, we have the manifestation of the secondary symptoms, which are known as the mucous patch. Here is a sloughing ulceration, the discharge from which is very infectious. We must remember that with a patient having syphilis we must be exceedingly careful in doing dental operations. We need not hesitate to do the work, but must take every precaution, because the discharge that comes from both the hard chancre and the mucous patch are exceedingly infectious, and it is easy to carry the infection from one patient to another, or from the patient to the dentist himself.

The third stage of the disease is a condition which can be prevented if the disease is properly treated in the secondary stage. Now the treatment is begun in the first stage, since we have the Wasserman reaction and the microscope. The tertiary symptoms, the stage of the disease that affects the palate and nasal bones, can be prevented if proper treatment is instituted during the primary and secondary stages. It is a question in the mind of the authorities whether the disease in the third stage is infectious or not. If it is infectious at all, it is probably not markedly so, yet it is well for us to be on the safe side, and even in the tertiary stage of the disease to take no unnecessary chances. I have made the statement before medical men (I made it once in Iowa and was told by a physician that it was the only statement I made to which he would take exception, and I desire to make it here) that in my opinion, notwithstanding the fact that syphilis in this day and age is supposed to be a curable disease, and can be cured according to our modern acceptation of that term, yet I believe that each individual affected with this disease has its indelible effects stamped on his osseous system, especially the jaws and adjacent parts; and if that person who has suffered from the infectious disease ever has a chronic infection, as in alveolar abscess, or a pyorrheal condition, it is more stubborn to treat, and there will more likely be necrosis than in a person not affected by this disease, notwithstanding the fact that he has been cured, in the general acceptation of the term, years before.

There is no doubt that syphilis can be cured today, but there is a question as to whether the patients will take the medicine long enough, when they feel and seem perfectly well, to effect a cure. If they will take the treatment long enough and carry it out religiously, there is no question but the disease as such can be cured, but I believe it leaves its indelible effects upon the bones of the jaws and adjacent structures.

Syphilographers have learned that mercury can be pushed much farther without getting the symptoms of ptyalism or salivation, if the mouth, especially the teeth, are given a prophylactic treatment; so every syphilographer at once sends his patient to the dentist to have the teeth gone over thoroughly from the prophylactic standpoint. It is our business to take the necessary precautions, and put that mouth in a thoroughly prophylactic condition, in order that the physician may push his salvarsan and mercury much farther in the systemic treatment of the disease.

I once removed a pulp under pressure anesthesia. Shortly afterward the patient suffered an accident in getting into his automobile. He bumped the side of his face against the car, the result of which was the exfoliation of that tooth. I was able to elicit a previous history of syphilis, the disease supposed to have been cured a number of years.

Mercurial stomatitis, where you have the gums sloughing away, the teeth loosening and where some of the teeth can almost be extracted by the fingers, follows the administration of mercury in the treatment of syphilis especially. We saw this before physicians recognized the fact that they could push their mercury further if the mouth first received a thorough prophylactic treatment. This case can be cured, and there is no reason why this treatment should not be carried on by the dentist. You should stop the introduction of mercury into the system, and should consult with the family physician. You can give potassium iodide, which aids in the elimination of the drug; it aids in getting the mercury out of the nucleonic acid which is in the tissues. You can scale the teeth as well as you can, and you can prescribe 10 grains of potassium chlorate to the ounce of water, preferably cinnamon water, and you have a saline solution which is a good mouth wash to use in such a case.

There is a case that stimulates this, to which I want to direct your attention. Gilmer, of Chicago, calls it Acute Ulcerous Gingivitis. The gingiva around certain teeth in the mouth, three or four usually, slough away, begin sloughing between the teeth and on the buccal surfaces; they very seldom slough away on the lingual. Frequently, if this gingivitis is not checked, it will go on until the entire alveolar process is exposed. Where the dentist often makes a mistake is that he scales the teeth and applies stringent pyorrheal remedies. This acute ulcerous gingivitis sometimes has a soft deposit, sometimes a hard deposit, right under the gum, which serves as the exciting agent of the disease, and the fact that you find this deposit there is about the only thing the disease has in common with pyorrhea. Yet patients will come time after time where the disease has been diagnosed as pyorrhea. Remedies like Argyrol, and mild stimulating remedies applied to the gum after the thorough prophylactic treatment should be used, and not the usual pyorrheal remedies that are so frequently applied. There are other conditions that simulate this, occurring frequently in the mouths of young people, and particularly young men, those addicted to smoking. I have more of those cases to treat after men come back from vacations where they have used a common drinking cup. There is a difference between these and Gilmer's gingivitis, in that all of the teeth may be simultaneously involved, or all one side of the mouth, and I have seen the gingiva between every tooth in the mouth involved in the sloughing process. It does not go so far as in acute ulcerous gingivitis, but it is a condition that simulates it, and the dentist should recognize it and treat it in the same way. You should scale and polish the necks of the teeth, remove all irritating material, leave the necks of the teeth as smooth as possible, and do not apply pyorrheal remedies, but mildly stimulating remedies, such as Argyrol.

A few years ago the people of the world shuddered when they heard and read of that horrible catastrophe of the sea, where fifteen hundred bodies were buried in the deep and fifteen hundred souls sent unexpectedly to their Maker. You remember we all shuddered when we learned that that floating palace, that modern hotel, that ship equipped with its every convenience, even its tennis courts, struck the iceberg and sank to the bottom of the sea. And yet we pick up the bulletin of the Chicago Health Department and read that there are 150,000 people dying annually in this country from the disease known as tuberculosis. There are over one million people in this country alone suffering from the disease, and are going about spreading the infection. In the city from which I come there are said to be four thousand people dying annually from tuberculosis. Tuberculosis is a preventable disease, a germ disease, and it frequently affects the soft tissues of the mouth. In one such case the entire posterior part of the mouth was affected. Some of the membrane was scraped in that case, the culture injected into a guinea pig, and the guinea pig died of tuberculosis.

We must remember that tuberculosis, among other diseases, is a preventable disease, and the dentists should join the crusade in trying to prevent in this country this great white plague. It is not within the province of the dentist as yet to treat a tubercular infection of the soft tissues of the mouth, for very little has been developed along the line of treating this disease, other than the various manifestations of light which have been used with success. But every one of us should be on the alert, and be able to recognize this infection when we see it manifested.

Recently I made the statement that tuberculosis very seldom affects the soft tissues of the mouth. A physician, discussing my remarks, said the reason there seems to be few tubercular infections of the mouth is because it is not recognized as it is recognized in its effects upon other portions of the body. There are two diseases which involve the tongue and the mucous membrane quite similarly. One is smokers' inflammation of the mouth and leucoplakia. They may be differentiated. Leucoplakia is supposed to frequently result in the development of carcinoma or cancer, or their lesions frequently have their origin in an old leucoplakia patch. That was manifested in ridges on the buccal mucous membrane of the tongue, usually parallel with the cutting surface of the posterior teeth, bright shining white streaks. In smokers' inflammation, which occurs in the mouths of men, the streak is more of a yellowish color, and the difference between leucoplakia and smokers' sore mouth may be known by that difference in color. The general practitioner should be in position to aid in making diagnoses of these various conditions.

I believe the profession has been derelict in duty, in that some other conditions have not been recognized, or, if recognized, have been disregarded, because there was no particular pain, and we have failed to correct them, and that is foci of infection around the roots of the teeth. Here is a tooth where half of the root was cut off four years previous and this filled up and the tooth is just as solid in the jaw as could be, and there was great stress on that tooth. From now on we must cure, either by extracting the tooth, or by means of surgery in some form, these infections about the tooth roots. If we had an infection in an ingrowing toenail, or one on our finger, we would not rest until that infection was cured; and yet patients and dentists have permitted infections far worse, where the infection was in the bone or modified bone, the alveolar process, to go on year after year, manufacturing toxines, carried into the blood in all parts of the body, and because it didn't create discomfort to the patient, and because the dentist did not cure that by means of drugs, he has permitted it to stand. The attention of the medical profession is focused on us, and it will be more so in the future than in the past, and many physicians will be glad to know that that obscure cause of rheumatism or neuralgia can be laid to the careless work of the dentist. We must either acknowledge that we are wrong, or prove that the work we did in that patient's mouth is not causing the systemic condition. That means a broader view on the part of the dentists.

Bismuth paste, if used right, and where it is indicated, is a good bone packing, but be careful and don't let it become encysted, or you will have an encysted condition to treat afterwards. I do not believe we should extract a tooth when we have an acute alveolar abscess unless the tooth is very loose. If you have a root firmly imbedded, which has an alveolar abscess, and if to get that root out you must break into the alveolar abscess, you are likely to have a bad condition.

When you use a local anesthetic, no matter what it is, and you want to carry it to the analgesic stage only, the man who is able to combine suggestion with his local anesthetic will sometimes have the patient go back on him, not as the result of the anesthetic, but as the result of shock. I do not believe an extensive operation should be carried on with a local anesthetic because of the shock. There are many operations in the mouth where you cannot control the hemorrhage as you can in the bone, and that should be done under a general anesthetic.

I want you to learn suggestion. Talk to your patients; make them believe you know what you are talking about, and if you have to do something that will produce shock, removing a piece of bone for instance, tell them before you show them the bone. Do not tell them to spit out the blood without telling them that you have a lot of blood, and they will not be surprised to see it. Warn them, and they won't think anything of it. Avoid these shocks as much as you can. You must be selective in your practice, and select the anesthetic that just fits the operation you are going to do. In the amputation of a tooth root, it is well to make an injection on the lingual also, and it will enable you to curette without pain. After you have curetted, pack with something to control the after-pain. Euroform Paste is an absolute specific. When you have cut down through healthy bone and curetted down to it, if you do not take some means to control pain, you will have pain. Take a piece of gauze, saturate it with euroform paste, pack it with that, and your patient will go home and be happy. He should return the next day to have the packing removed and the wound washed out, and he will report no pain. You may have a little swelling in about 25 per cent. of the cases.

DISCUSSION

DR. HOWARD RAPER: As I saw the pictures on the screen, illustrating Dr. Buckley's lecture, I thought of what Abe Martin says, "There ain't nobody so brave that he can't be scared by a specialist." Those beautiful pictures of leucoplakia, stomatitis, etc., would scare most anybody.

It is a very good thing to have a man come to us and show such pictures. It reminds us of our moral obligations to our patients. I refer now particularly to the illustrations of syphilitic lesions. Dr. Buckley reminds us that, while syphilis may be curable, it leaves an indelible stamp upon the individual who once contracts it. So I can conceive of no greater crime than for a dentist to transfer syphilitic infection from one mouth to another.

In considering the different forms of stomatitis, I want to suggest that in some cases you will be unable to find the cause until you inquire into the habits of the patient, when you may learn that he is chronically constipated, and that he takes some proprietary cathartic. Some of the proprietary cathartics contain mercury, and these habitual users of proprietary cathartics sometimes take a sufficient amount of mercury to produce mercurial stomatitis.*

Dr. Buckley suggests that when the canal of an abscessed, crowned tooth is unfilled, it is necessary to remove the crown, even though the crown be perfectly adjusted, in order to treat the abscess through the canal and fill the canal. I, too, used to think this the only proper course to pursue, until I saw Dr. Carl Lucas demonstrate a different procedure at a clinical operation, at the Indiana Dental College, a short time ago. The case was one of a chronically abscessed, Richmond crowned, central incisor, the Richmond crown serving as an abutment for a bridge. A radiograph showed the canal unfilled. The operation consisted in the amputation of the apex of the root, and the filling of the apical portion of the canal with amalgam. Thus removal of the crown was not necessary in this case, because root amputation was indicated and the incision made for the operation made it possible to fill the end of the canal.

Dr. Buckley tells us we must guard against local foci of infection. He says the eyes of the medical profession are upon us. What he says is true. A few days ago a dentist in Indianapolis phoned me and asked me to consult with him about a patient who had lately come to him from Chicago hospital. She was suffering from rheumatism. Her physician had advised her to have all her teeth extracted. Radiographs had been made, and many of her teeth were chronically abscessed, but not *all* of them. The physician was wrong when he advised the extraction of *all* the teeth, because it is obviously wrong to extract a bicuspid tooth because a cuspid is abscessed. But, if her physician made a mistake in advising the extraction of *all* the teeth, it was no greater mistake than her dentist had made in allowing *any* chronically abscessed teeth to remain in the mouth. In fact, physicians are advising useless extraction only because dentists have failed to practice it where indicated.

A discussion of a paper is never interesting when the discussor agrees with what the lecturer said, and I agree with practically everything Dr. Buckley has said. One thing I can disagree with vigorously is his idea of not extracting an acutely abscessed tooth. He suggests that this acutely abscessed tooth is perfectly solid. I cannot imagine an acutely abscessed tooth being firm in its socket, when the case is one where the face has been swollen for any length of time; and I cannot see why it is wrong to give an opportunity for an accumulation of pus to escape. That is all you are doing when you extract an abscessed tooth; you are simply making a vent for the escape of pus. It is less dangerous to do this than to keep the tooth in the mouth and force the pus into the circulation.

Now, as we learn of the grave constitutional diseases which may result from local infection in the mouth, we see that we must resort to the apicalectomy operation oftener; and Dr. Buckley takes the time to come to us and review us in the technic of the operation. Also, he takes the instruments needed for the operation and puts them all together in a box, so we do not need to look over a dozen catalogs to find what we want. He fails to find a needed instrument in dental or surgical catalogs, so he designs one, and gives us a complete set for root amputation. He is everlastingly doing something for us to make our work easier and better. Is it any wonder, then, that we hold him in such high esteem?

DR. A. R. ROSS: Dr. Raper so thoroughly covered the points given by Dr. Buckley that he hasn't left much for Dr. Mason or myself to say. Having failed to receive in advance a copy of Dr. Buckley's talk, I asked him this afternoon what he was going to talk about. He answered, "I will see you after a while and let you know." The after a while did not come and my first intimation of Dr. Buckley's remarks came to me as he was delivering his address this evening. I think you will all admit that the pictures Dr. Buckley has shown on the screen illustrating the various types of mouth diseases should impress on our minds one thing above all else, and that is the necessity for absolute cleanliness in every operation upon the mouth. We cannot afford to neglect the sterilization of instruments but must have them and everything we use as nearly in an aseptic condition as possible, regardless of the nature of the operation.

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*I have recently seen a case of severe ulcerated stomatitis, caused by mercurial poisoning, the poison having occurred as a result of the application of great quantities of blue ointment for Pediculi Pubis, September 24th, 1914.

If from the talk we have just listened to, we realize that we do not recognize the mouth signs of different pathologic conditions as clearly as we should, then in justice to ourselves and our patients, we cannot afford to take any risks whatever, but should use every method to keep our instruments absolutely sterile. I think it has been a magnificent exposition that Dr. Buckley has given us, and it should impress upon us the necessity for cleanliness and a more accurate knowledge of therapeutics and mouth conditions. If we but learn this lesson our time at this convention will have been used to excellent advantage.

Dr. M. A. Mason: Dr. Buckley has again impressed upon me the importance of one or two subjects brought prominently to our attention at our conventions. I have been associated for many years with a specialist in eye, ear, nose and throat, and many times he has come in and said, "I do not think the dentists of Ft. Wayne, and in general, recognize the specific troubles that are so frequently present in the mouth, and deal with these cases as they should." I think that is true. Many cases do escape our attention that we should be able to recognize, and would be if we were observing and read up on the subjects sufficiently. Sometimes he will call my attention to a grave case that comes to his attention. Just the other day a patient was sent to me, and the physician sending her called me up and said, "Take particular care. She has specific trouble." That was a nice thing for him to do. The last topic the doctor dwelt on has been dwelt on so frequently that it impresses upon us the importance of treating cases of pyorrhea and abscesses to avoid systemic trouble; and if we go away from here with nothing else fixed upon our minds than these two or three points brought to our attention, and go home with the resolution to do everything to prevent serious systemic troubles, we will be well repaid for coming here.

The President: I want to emphasize a remark made by Dr. Raper. It has occurred to me, and some of my friends and neighbors in the city have remarked that physicians will sometimes ask you to extract teeth that are good teeth, because there is some source of infection in the mouth, or a possible source of infection in the mouth. I have known of cases of that kind. Are you going to follow their advice, or will you tell the physician in the proper way what you think should be done? I know of a specialist extracting a tooth that he thought should not be extracted, because the surgeon told him to take it out and he would stand back of him. They will be after us faster and oftener in the future than we want them to. We must get conversant with the most modern things in dentistry in the line of therapeutics and preventive treatment, and stand our own ground. I am glad Dr. Raper made that point. The X-ray is perhaps our salvation. We have no more right to try to do some things in the mouth that we do try to do, than the surgeon has to try to reduce a complicated fracture, without an X-ray.

This afternoon a train coming in from one of the great cities of the United States brought the president of the National Association, and I would like to call upon him to give us a few words.

Dr. H. C. Brown: I assure you I am very glad indeed to be here on this occasion, and to say that I was surprised at being called upon expresses it only mildly. I was much interested in Dr. Buckley's talk. He presented one picture tonight that reminded me of a case that came to me a few years ago. It was the lady with the sinus opening under the chin. On this occasion a physician called me, and wanted to know when I could see the case. He brought the patient in, accompanied by her father and by a very excellent X-ray plate. She carried her chin in a sling, so to speak, for the reason there was a constant discharge from a couple of sinuses, and when this was removed she presented a very discouraging appearance. She had been under treatment for two or three years. Her case had originally been diagnosed as a cancer, and had been treated by a cancer specialist with plasters. After failing to secure results, this specialist in a small town not far from Columbus, took her to one of our most prominent surgeons. He operated and reoperated, and then went to an X-ray specialist, who gave her forty-five X-ray treatments. After the X-ray treatments a plate was made, and she was brought to me. The request was made that I extract the two lower incisors, that were clearly shown to be involved. I refused to extract the teeth, just as the specialist in extraction should have done in the case referred to by Dr. Kennedy. I told the physician, the patient and her father that I could see nothing to be gained by extracting those teeth, especially until a start had been made to remove the trouble by opening up and treating those two dead teeth. The father explained that he didn't think the teeth had anything to do with it, and they wouldn't have anything done without consulting the surgeon who had operated. I said, "That is perfectly proper, but when you consult him, tell him what I have said about the teeth being involved, and the conservative treatment I have suggested that should be given in order to cure the existing condition." I heard nothing for some time, and after a while I sent a statement to her father for consultation. The impression left with me was that they had been to considerable expense, and there was an indication that they were not able to take care of anything, and my fee was a very small one; but that seemingly shocked the old gentleman, and after more or less delay, and a telephone conversation or two, I compromised with them on a fifty per cent. basis. The following morning a friend of mine called in, who wanted to see another dentist in the building, and so I called him down, telling him that this was a matter of consultation, to get him to hurry down, and this reminded me of the compromise that was effected the day before. I started to tell the gentleman of the case, and he said, "Who was that?" I told him, and he said, "Why, I treated that case." I said, "Let me tell you my diagnosis, and let me know how nearly correct I was." He said, "You were absolutely correct." The case was referred to me by a surgeon and later developments showed that when this patient returned to her surgeon, he took her to the hospital and performed another operation, and then, after no results, he sent her to his own dentist, possibly thinking that he would have some hesitancy in sending her back to me. The dentist in question opened up these two central incisors and treated them only a brief period of time, absolutely curing all the trouble that existed. The amusing feature of this is that the dentist told me he had trouble in collecting his small fee. They made arrangements with this gentleman in advance that he was to charge $12 for opening up and filling the roots of those two teeth. He said the teeth were so readily cured that the father and daughter objected to paying the bill because he had not been required to do the amount of work they thought he would be required to do. The young lady later took a nursing course and graduated from the hospital in which the physician is the chief operator. That young lady called at my office some time following this, and explained the situation to me, and to my surprise I learned at that time of this operation following her visit to my office. She is disfigured, so to speak, but she explained that it was necessary, after her dental operation, and the case was entirely cured, to have another operation. I said, "What for?" She said, "Well, you know I had been operated upon so often that it was necessary to make a plastic operation, endeavoring to correct the deformities occasioned by the former operations."

I am not criticising the medical profession, but I wish to emphasize one thing that has been brought out here tonight, and that is that the medical profession is looking to the dental profession at this time for relief, and they are going to look to us for relief and co-operation in the future a great deal more than they are at this time. I am quite sure that that surgeon gives much more careful consideration to such conditions as might exist than he did at that time.

In behalf of the National Association, I wish to emphasize the point that it is quite necessary for us to co-operate with the medical profession in every possible way. I think where there is a difference as to whether a tooth should be extracted, there should be a consultation between the physician and dentist. It is our duty to co-operate with the medical men, and the time is not far distant when the co-operation of these two professions will accomplish far better results.

Dr. Buckley (closing): I appreciate all the words that my friends have spoken, and I want to say that this evening's entire program has been so harmonious that I am even sorry that Dr. Raper misunderstood me on that one point. If there is swelling and pus, and the tooth is loose, I would extract it, but the condition I meant was that of incipient abscess, where there is an infection, but not pus, no swelling, the tissues not broken down and the tooth not loose, and you are likely to get infection if you extract that firmly imbedded tooth at that particular time. If you wait until that incipient abscess has developed, and you have an abscess, that presents a different situation. It may be I was not quite accurate in my diction, and used "acute" somewhat loosely.

Dr. Cooper: If you have a pain, how would you get rid of it?

Dr. Buckley: I would treat it by general analgesics. You won't get rid of that by extracting. All I will say about fees in connection with surgery is that no fee should ever be charged that imposes a hardship on the patient to pay.

OFFICE CLINIC*

BY DRS. C. J. LYONS AND C. D. LUCAS

I. Apical excision performed by C. J. Lyons, D.D.S., Ann Arbor Michigan.

Submucous anaesthesia Novocain-Suprarenin.

II. Testing the vitality of pulp of teeth.

One dry cell battery attached to vibrator; platinum needle in thermocautery needle holder forming one pole and the other in patient's hand. Touch suspected tooth with platinum needle. If vital, electric shock. If devitalized, no reflex, by C. D. Lucas

III. Casting with Rassmussen air machine, by C. D. Lucas.

IV. Surgical pathological microscopical exhibit, by C. D. Lucas

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*Clinic at Indiana State Dental Society 1914.

GOLD INLAY, SOME SPECIAL FEATURES OF M.O.D. CAVITY IN MOLAR*

BY DR. CLEM SHIDLER, SOUTH BEND, INDIANA

We are endeavoring to get away from casting these M. O. D. fillings in one filling, by casting the mesial portion, or the distal portion first, whichever it may be, producing a separation, getting space either mesiodistally first, and preparing that portion of the cavity and making the filling, restoring the contact point, letting the tooth set back in its socket, and then getting separation at the opposite contact point at the next sitting, and completing the filling there, and interlocking those two fillings on the occlusal, producing an M. O. D. filling in two fillings instead of one, hoping to produce better contact point and to avoid the shrinking of the filling, and the failures we may get at the gingival border, both mesially and distally.

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*Clinic Northern Indiana Dental Society, 1914.

IDEALISM

BY EARL G. JONES, D.D.S., COLUMBUS, OHIO

IDEALISM, ACCORDING TO WEBSTER, is that perfection which exists only in one's mind. Therefore, we have to start with the assumption that Idealism can never be attained, but perfection is a substitute that is obtainable.

Although the subject at first thought may seem rather narrow, I wish to expand it—in the space of type allotted me—by dividing it into three subdivisions, namely: Education, Progress and Perfection.

John Wanamaker once said, "Young man, near your own feet lie treasures untold, and you can have them all by faithful study." Let us not be content to mine the most coal, build the largest locomotives, etc., but amid the sound of the pick, the blows of the hammer and the rattle of machinery, take care that the immortal mechanism of God's own hand—the mind—is still fully trained for the highest and noblest service. The uneducated man is always placed at a disadvantage; it is not enough to possess ability; it must be made available by mental discipline.

We have passed beyond the age of simple "Mechanical Dentistry," and we have been acknowledged by the medical profession as one of the greatest specialties of medicine. You ask what has brought about this change? I answer, education. The raising of our college entrance requirements, the study of anatomy, physiology, bacteriology, oral surgery, pathology, etc., the raising of our state board standard of examination and the co-operation of our fellow practitioners brought about in the papers, discussions and clinics at our national, state and component society meetings. The man whose education stops where business begins, and who never has time to do anything but keep the path hot between home and office, is not only digging his professional grave, but is lowering the standard of the entire profession; and this very thing has done much to cause our profession to advance more slowly than it otherwise would have advanced. We have a few men in public prominence, but too few.

Some will say, "At my age, how can I expect to attain these higher educational standards?" To do so it is not necessary that one matriculate in a college—there is an advantage in this however. The danger of trying to educate one's self lies in desultory, disconnected, aimless studying, which does not benefit, but on the other hand benefit may be derived through careful study of text books, magazines, etc. A habit of forcing one's self to fix the mind steadfastly and systematically upon certain studies, even if only for a period of a few minutes at a time, is of the greatest value. A leading man of a theatrical stock company told me he was able to commit many of his lines each week by hanging them by the side of the mirror each morning as he shaved—time lost to the most of us. Education, therefore, is the fundamental, the masonry that gives us a footing to success.

Man was made for growth, and in this second division of my topic, I wish to show where the dental profession has made rapid strides toward a goal, not of idealism but of progress. Why, within the last fifty years we have made such an advancement that a dentist of a half century ago could no more take the place of a dentist of today than could Paul Revere take the place of the telephone in this the twentieth century. We cannot imagine in this day and age, cavity preparation with instruments made and designed by ourselves, and without the aid of a dental engine, and yet such was the condition fifty years ago.

Amalgam, we have with us always. It is one of the best filling materials, and yet one of the worst, the most extensively used, and yet the least used—correctly; one of the strongest, yet the weakest. Why all these seemingly contradictory remarks? I'll tell you why: It is too easily manipulated. If we would pay as much attention to cavity preparation and insertion of amalgams as we do to our gold and silicate fillings, there would be fewer of them coming out. I wonder how many of us always have our patients return in order that the fillings may be polished, teeth separated if necessary, so that the contact point may not be destroyed in polishing the interproximal space, etc. We do it for the gold and silicate fillings; why not the amalgam? Here the almighty dollar comes into play; the standard and fee for the amalgam is too low, and it is up to each one of us to advance the standard. The amalgam filling is only what we make it, just as we ourselves are only what we make ourselves.

Rapid progress is being made by our research corps, headed by Dr. Weston A. Price. Surely much praise is due these men. Dr. Price in his clinic at the National Association, showed us how in gold inlay work to overcome the contraction of gold, by expanding the wax impression sufficiently to overcome the contraction of the gold. A saddle inlay cannot be made with any degree of accuracy without this knowledge. Also that tungsten is a metal which is non corrosive, cheaper and firmer than platinum; facts which cannot be overrated in steps of progress.

I wish to speak of the advancement in bridge work. Bridge work is comparatively a new phase of dentistry. A few years ago all we knew was the pin facing bridge. In this we lost all the translucency of the porcelain. In case of a broken facing, a repair meant a removal of the bridge and a botched up job all around. Now we have our Steele's and Goslee's, which may be replaced and the bridge be in as good condition as at first. In the writer's opinion the Goslee bridge makes a beautiful restoration. In this the translucency of the porcelain is not lost by a gold backing. I do not wish to impart the idea that pin facings should be discarded, for there are a few cases where they are of great value.

The rapid awakening of the laity is a fact that should cause every dentist to be alert and progressive. People are fast realizing the importance of their teeth and are willing to have the best work obtainable and pay the fee for it. That is why our specialists are busy all the time and our cheap men advertising for more work. Why, if the laity knew that between 80 and 90% of the root canals were improperly filled, they would keep our X-ray men working overtime trying to make sure that the root canals of their teeth had been properly filled, and that they were not included in that large percentage. And then again how many dentists will say that they believe that the root canals they have filled have been properly done, "for, with a very few exceptions, all cases have given no trouble;" and yet these same men will argue against radiographs as an unnecessary expense, when in reality all their argument is only to protect their rotten work. That is not progress. Improperly filled root canals not only cause a resorption of the root, dry and moist gangrene, but according to Dr. E. S. Best, cause general systemic disturbances, through the blood taking up this sloughing waste. Surely it is time to broaden out, acknowledge our faults, overcome such conditions, advance our profession and humanity.

Dr. Joseph Colt Bloodgood, of Johns Hopkins University, made the following statement: "Dentistry is the first branch of the medical science to practice preventive medicine." One-fourth of all fatal cancerous conditions are in, or originate in, the oral cavity. This is certainly a big statement. We have a wonderful opportunity before us. Patients should be informed every six months that it is time for an examination, or they come of their own accord. If their teeth are in good condition, probably cleaning will be all that is necessary, if not, conditions can be taken care of with very little trouble. A physician has not this valuable opportunity. His patients never call except in case of necessity. Nearly all cancerous conditions can be cured without much difficulty if taken in time. Most of us, however, are too prone to begin our operations without a thorough examination. A patient comes in with an aching tooth. At once we begin a treatment of the tooth without a question from the patient, or without any knowledge of the remainder of the mouth. We have lost our opportunity. We may have stopped the toothache, but let go unnoticed a condition which some day may become a fatal one.

Along the line of progress I think I should miss an important step if I should overlook our specialists. The orthodontist, in his long, unwearied efforts, is doing a wonderful work. One's beauty is in exact harmony with the beauty and regularity of his teeth. What a grave mistake it is that an ordinary practitioner without any more study and training than his mechanical knowledge, should undertake work of this kind, when it requires the skilled knowledge of a specialist. I have in mind a difficult case that was taken to a specialist, diagnosed, and a fee set.

The mother then went to several general practitioners on a "shopping" tour, and she found she could get the teeth regulated for almost $100.00 less than the specialist's fee, in less time and "guaranteed." (And here is a term I wish we could eliminate—"guaranteed." It's ridiculous to think of guaranteeing a piece of repair work; and that is what every piece of dental work is. Mechanics in other lines do not make a practice of guaranteeing repair work. Why should we guarantee a piece of work which at best is none too good? When a dentist guarantees a piece of work he fully expects to find a reason if the work ever comes back, why it is not his fault that the work has gone bad. Why lie to patients under the shield of a guarantee?) Well, this man "guaranteed" a piece of work which could only be completed with nature's assistance, and the "Almighty," Himself, only knew how the case would terminate. He took models and appliances made a year previous (in the meanwhile the child had lost five temporary teeth); he extracted two permanent lower teeth, rounded the arches, with the result that the lower arch is too small to be in harmony with the upper, and the beauty of the face is lost for the rest of life. There is an overbite of over three-fourths the upper incisors.

Too bad, isn't it, that for $75.00 a man without proper knowledge ruined this girl's appearance for life? But in spite of a few cases like the above mentioned, the specialists in orthodontia, anesthesia, prophylaxis and prosthetic work of all kinds are successfully advancing, and the most of us are doing everything within our power to encourage their advancement. Let us do all that we can do, well, and not check the progress of dentistry, or endanger humanity by trying to do that which other men are more capable of doing, even though it might bring a few dollars into our coffers.

In the beginning of my paper I gave to this third division the subtitle of "Perfection." I now wish to pick up some of the threads of thought I have unwound in the preceding paragraphs, and with a few suggestions close my paper. Men have two kinds of ambition—one for dollar-making and the other for life-making. Some turn all their ability, education, health and energy into the first of these—dollar-making—and call the result a success. Others turn them toward the second, into character, usefulness, helpfulness, serving of humanity—and the world sometimes calls them failures, but history calls them successes. We can attain perfection only when we follow out the second thought. Surely with all our advantages of technic, our silicate fillings, improved inlay and bridge work, we should be doing fine work. Let us get out of the ruts, forget our selfishness, be boosters instead of knockers and parasites; coworkers instead of competitors. The time is not far distant when the dental surgeon will be proud of his specialty of medicine for the medical profession is joining hands, not for personal benefits, but for the aid of humanity. Our educational requirements will have been raised; we will not see how much work we can get done, but how well we can do it. Then, and only then, will we in any degree be nearing perfection and mental Idealism. Longfellow in his Psalm of Life, very beautifully expresses the sentiment when he says:

> Life is real! Life is earnest!
> And the grave is not its goal;
> "Dust thou art, to dust returneth"
> Was not spoken of the soul.
>
> Not enjoyment, and not sorrow,
> Is our destined end or way,
> But to act, that each tomorrow
> Find us farther than today.
>
> * * * * *
>
> Let us, then, be up and doing,
> With a heart for any fate;
> Still achieving, still pursuing,
> Learn to labor and to wait.

1209 W. Broad St.

PYORRHEA*

BY DR. E. B. HOSOM, JACKSON, MICHIGAN

This skull presents every phase of the dread disease, pyorrhea, which I feel safe in saying is more prevalent at the advanced stage of civilized man than any other oral infection, excepting, perhaps, caries of the teeth. Here is a most perfect anatomical occlusion, though we are taught by men of high authority that pyorrhea is largely due to malocclusion. Granting that to be true, I yet hold that no mouth of however perfect occlusion is free from the ravages of pyorrhea. If we could break up the fermentive processes which I believe to be the direct and exciting cause, whether preventive treatment is by instrumentation or otherwise, we will have performed a valuable service to long-suffering humanity. This work of alleviation, I would say, is practically in its infancy, and much remains for the on-coming and younger men of the profession if they are to follow the lines of true professionalism. (Referring to skull). You will note at this point we have a destruction of the peridental membrane, held by some authorities to be the most important of the dental tissues, which precedes the breaking down of the cementum. You will now notice the smooth bone-dentine. This would indicate to us in our daily routine a hypersensitiveness.

You will note at this point the little line where the gum tissue has been retracted from its resting place against the tooth by a salivary or ptyalogenic deposit first, and subsequent fermentation under the gum. Here I would state that the gum septum provides a wonderful protection to the tooth and should receive the utmost care and consideration by the dental surgeon. A pocket is formed at these points as a result of the spicules

*Clinic Indiana State Dental Society, 1914.

of bone having been dissected away by these deposits, which we plainly see here upon the roots. We now have a process which will result in further destruction of the alveolar tissue. This, we will designate as it has been termed, the sub-gingival deposit. We now have further breaking down of tissue a calculi which is produced by an organism of the pyogenic group and at this juncture we may look for pus. Increased heat of the inflamed area, superinduced by moisture and air with broken-down tissue already noted, whether or not attended by pus, will bring about sure and speedy destruction of the remaining tissue and the consequent loss of the dental members, unless a mechanical corrective process be at once instituted. You would not expect a regeneration of bone where you find that condition. It is not only necessary to go after these tooth roots and plane them to the utmost of your skill, keeping well in mind tactile sense, but to polish them with a thoroughness not to be outdone. Also the curette should be employed wherever necessary in order to remove sequestrum and all extraneous matter always more or less present.

At this point I cannot finally resist taking advantage of the opportunity to remind ourselves of the splendid teaching of J. Lowe Young in the perfecting of anatomical occlusion to the end that all tooth restorations by us shall be a perfect and true imitation of nature. How many of us are restoring the *developmental ridge* in our inlay work? This alone is one long step in "preventive dentistry."

THE SILICATE CEMENT—ASCHER'S NEW ENAMEL

BY F. W. SORRELS, D.D.S., ABILENE, KANSAS

JUST NOW, while forces are active for a wider recognition of dentistry and increased respect for those who practice the profession, there remains a tendency among many operators to get into ruts, or follow any tangent which leads them along the line of least resistance. Too frequently a certain method of procedure appeals to a practitioner and he follows that method blindly in all cases, regardless of the fact that another method would serve a better purpose in a given instance.

Back of all operative procedures there should be the well-formulated and definite aim to perform such an operation as will best serve the interests of the patient, mainly along esthetic and durable lines. Close study of the behavior of filling materials in different classes of cavities is necessary before an operator can determine what is the proper filling material to use in each case, and it is with the hope of aiding in this study that the following suggestions are made.

The difficulty of laying down any definite rules is increased by the varying conditions which are presented to the operator in his daily work. These conditions must be reckoned with, and often it is a matter of nice judgment to decide which material shall be used. Certain physical properties possessed by one material are absent in another, which might prove a prominent factor in determining its fitness for a certain class of cavities.

The ideal filling material should possess compatibility with tooth-life and health, durability, plasticity, ease of manipulation, and preserve the natural appearance and integrity of the tooth.

Cavities in small proximal surfaces of incisors and cuspids have presented the most difficult problems for the dentist to solve. It is not that they are more complicated than some others as far as saving teeth is concerned. This can be done with gold foil or, in some instances when the incisal edge is gone, with the gold inlay. In most mouths these teeth are exposed to view in conversation, and the display of gold is objectionable. No matter how much we may assert that the prime object of filling teeth is to prevent caries and save teeth, the esthetic taste of our modern civilization forces upon us another consideration, which we, as a cultured profession, should foster and not combat. All evidence of our operative interferences, therefore, should be as completely disguised from public view as our ingenuity can accomplish. This view of the case often contra-indicates gold on account of its color and lack of translucency. It is undeniable that gold is conspicuous in many mouths in anterior teeth and often in bicuspids and upper first molars, and if we are to live up to the highest possibilities of esthetic dentistry, we must avoid it in these cases.

When gold cannot be used, our choice might be gutta percha or the oxyphosphates, but their field is so limited except for temporary work that they need not be considered in this paper.

Our attention then must be directed to porcelain and the silicate cement, known as Ascher's New Enamel. Of the two, Ascher's New Enamel gives the most satisfactory results in the vast majority of cases. The ease of its technic makes it especially favorable, and it has been time-tried. When properly inserted, such fillings have given good service for many years and they give promise of many more. These fillings are unrivaled from an esthetic point of view, as any tooth can be matched perfectly by having a thorough knowledge of colors. Blending two or more colors is usually indicated for each case.

All know the extreme difficulty of obtaining perfect technical results in in very small cavities and in those extending over two or more surfaces. Proximal cavities extending from labial to lingual, for porcelain inlays, demand elaborate sacrifice of tooth structure, either labially or lingually, to permit ease of withdrawing and inserting. These needless sacrifices can be totally eliminated by the use of the silicate (Ascher's New Enamel). Margins of porcelain inlays, after a short time of service, frequently are found to be in a very unsatisfactory condition, owing to chipping of the material or to staining of the line between inlay and tooth. Either of these conditions leave the inlay unsightly. The appearance of the silicate is a distinct improvement over the porcelain.

To further emphasize the wide range of usefulness of the silicate cement (Ascher's New Enamel) in proximal cavities, our patients are rapidly favoring its use. They object to the discomforts of having gold foil fillings malleted, trimmed and polished as the entire operation requires an hour or longer. Compare this kind of a session with the relative ease of silicate work. My experience has proven Ascher's New Enamel to be much superior to porcelain inlays in withstanding stress where incisal angles have been restored. However, for extreme cases we have a very encouraging solution for its use in combination with the gold inlay. When the incisal angle has been destroyed a gold inlay may be made, but before casting the inlay carve a retentive cavity in labial surface of wax model, which, after the inlay is cemented, may be filled with silicate cement of the proper shade; thus gold is placed where it receives the stress and silicate cement where it is exposed to view. The use of amalgam and gold has decreased since the advent of the silicate with its high-class service.

In conclusion, we will do well to carefully study indications for its use by contrast with other materials at our command, so we can best serve our patients and ourselves.

ANATOMICAL OCCLUSION*

1. BY DR. J. H. PROTHERO, CHICAGO, ILLINOIS

THIS IS A PROGRESSIVE CLINIC, to show the different steps taken in impression-taking and cast construction for vulcanite work. I want to say something about taking impressions, about the materials for casts, the construction of main plates, etc., and bring it up to the point of the next clinic. In sixty per cent. of the cases you can use modeling compound better than plaster of Paris, because modeling compound does not change or expand all the time. All plaster expands, and it will expand in the direction of least resistance, and you will have a warped model. Unless the impression and tray are removed immediately from the model, it will warp. After you remove it, you do not get warping, but you get enlargement, due to expansion. There are, however, four cases where you cannot use modeling compound. They are: *First*, where some of the teeth are left; *second*, where the jaws are soft and flabby; *third*, where there are heavy undercuts, and *fourth*, where there is a thick resilient layer of mucous membrane all over the palatine portion of the mouth. In those cases we must use plaster. We use too much pressure in connection with plaster work, and the result of that is that many cases are thus ruined. I have been experimenting with artificial stone. It is commercial magnesia, and not chemically pure. It is magnesium oxide combined with magnesium chloride. Out of that you make a super-saturated solution. You should have some crystals standing in the bottom of the stock vessel at all times. When you get ready to mix, put enough liquid in the bowl and keep adding powder and stirring until you have a thick mix. Work it the same as with plaster, only stir more rapidly and longer, and mix the mass stiffer. Spatulate thoroughly, seven or eight minutes, the idea being to satisfy every granule with some of the liquid. I pour my impression at night, and in the morning I have a piece of solid stone. In hardening a plaster cast, dip it in a solution of borax and water, a boiling borax solution, for about a minute. Or you can boil in paraffine or rather, steerine, for eight or ten minutes. The greatest care you can take in making casts and in taking care of them is none too great. On lower cases, take a spoon excavator, and in the impression begin to scrape. 1-25th-inch is deep enough, and it makes a little ridge, and it enables you to get suction on the lower plate. As it settles down, it presses the air out, and you get pressure there. Don't let your groove run clear to the edge of the plate, because the air will get in and you will have no suction. Don't make the bead at the periphery of the plate. Cut it forward, so as not to make the patient gag.

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*Stenographic report of Progressive Clinic on "Anatomical Occlusion" given at Indiana State Dental Society, 1914.

2. DR. J. M. HALE, MT. VERNON, IND.

As we progress in the practice of anatomical occlusion, we are impressed more and more with the necessity for accuracy at each step; for one step falsely made will defeat the greatest care at all other points. This portion of the Snow face-bow is known as the bite stem. This stem is heated to a temperature which readily softens wax, and is inserted deeply into the labial surface of the upper wax trial plate, parallel with the occlusal plane of the trial plate. It also projects forward as an extension of the median line, and should be firmly set. The face-bow is one of the most essential appliances in these procedures. By its use the correct relationship between the alveolar planes of the mouth and the condyles, where it rests in the glenoid fossa, is determined, and the wax contour models are transferred from the mouth to the occluding frame, so that the alveolar planes of the cast, when mounted, will bear a similar relationship to the frame hinges. Teeth, when mounted on the wax contour models will thus be placed approximately the correct radial distance from the rotation centers of the mandible, so that the cusps of the lower teeth may work from side to side in lateral movement without interference. The bite stem is inserted in the place previously made for it in the upper wax contour model and luted with a hot spatula. The central clamp of the face bow is passed over the rod of the bite stem, the terminal ends of the bow carried backward until the condyle rods are opposite the points previously marked on the face. The rods are pushed in until they are in contact with the face, care being taken to have the same number of gradations showing between the inner sides of the bow and the face. The clamps of the condyle rods are now tightened. Care should be taken to see that the ends of the rods have not dropped or drawn the integument below the condyle end. The operator should hold the rods in position while the assistant or patient tightens the clamp of the bite stem. The clamps of the condyle rods are now released, the rods are drawn out, the patient is instructed to open the mouth, and the wax contour models attached to the bow are removed. The clamps of the condyle rods are now released, and the rods moved in full length. The occluding frame is placed upon the tin base, its lower bow engaging with the locks of the latter, to prevent the frame from tipping while mounting the cast. The face-bow is strung apart sufficiently to allow the condyle rods to engage with the projecting locks of the frame hinges. The face-bow is leveled up parallel with the bench on which the frame rests, by placing a block of suitable thickness under the central clamp of the bow. The upper bow is thrown backward, the upper cast is adjusted in the upper wax bite, and luted with wax to prevent displacement. The upper bow is brought forward and down upon the base of the cast, and attached with plaster. When set, the entire frame is inverted, the lower bow thrown backward, the lower cast adjusted in the lower wax bite, the lower bite dropped down upon the face of the cast, and the two attached in a similar manner to the upper. When the plaster has set, the face bow and bite locks are removed, and the cast is ready for the next important step.

3. DR. J. A. DINWIDDIE, LOWELL, INDIANA

The last clinician has his models on the articulator. We are now ready to register the path of the condyle in this given patient. In order to do that we take our lower wax model as we see it, and taking the little metal bite gauges which go with the articulator, heat them thoroughly and imbed them thoroughly into the lower bite plate, about three-quarters of an inch in front of the heel of the lower base plate. If you get them too far back, the patient in closing down in the occlusal bite will cause them to kick up or slide out. You are now ready to put this in the patient's mouth, and instruct the patient how to protrude lower, being careful not to have them protrude too far. They must protrude at least one-eighth inch, and not to exceed one-fourth inch, because less than one-eighth or more than one-fourth might not be a correct registration of the path of the condyle. You want to register the greatest dip of the condyle in the protrusive motion. If it slides out on a horizontal plane, it will be incorrect registration, because the patient does not use that in grinding. Ask your patient to bite foward, being careful that the median line is still the median line, putting your forefinger on the chin and having him bite, and hold it there. We want the anterior portions in contact; we do not care about the rest. Then lock it into position with the bite locks, one in front and one on each side. The angles are very seldom absolutely the same. My experience has been that not one out of twenty has both sides absolutely the same. The rule is, malformation is dependent on the length of time the molars have been lost. We are now ready to register on the articulator absolutely what you have registered in the mouth. First, loosen those lock nuts, unhook the back spring, and your articulator will be like that. Place lower base plate on model on the articulator, and fix it immovable with wax. Then settle the upper model into the upper base plate. The lower does not move, but the upper does. Apply pressure on the median line in center of models, both upper and lower, with your finger above and your thumb below. When you do that, the condyle slots will assume a certain angle. That is approximately correct. If the pressure is brought to bear too much on the anterior portion you will have improper registration; if too much on the back, you will have improper registration. Then test the condyle slots on one side to see there is no friction, and then lock it tight; then test the other side and lock it. If all the steps have been correct, you never want to change that. Remove the staples, remove the bite gauges; these condyle paths are set; attach the spring and the lower jumps right back to normal bite. The condyle paths have been set. The reason that it goes back to normal, after the protrusive bite, is that the spring is loosened and it, of course, jumps right back.

4. DR. OTTO U. KING, HUNTINGTON, INDIANA

This is the fourth step in anatomical occlusion. Dr. Dinwiddie left you with the articulator registering the condyle paths, and the articulator locked. You want a definite line representing the occlusal surface; you don't want any uneven places for the occlusal plane must be well defined. If you have not a definite line of demarcation between the upper and lower base plates at the occlusal surface you will have trouble in finding the condyle path and also in arranging the teeth. You must bear in mind that your base plate wax here represented has been molded in the mouth until all the facial lines of the face of the patient have been restored. You also have the high lip line, the low lip line and the median line.

One of the most difficult things to understand and yet the easiest after it is thoroughly mastered is to find the compensating curve. On this practical case that I have in my hand we want to register the condyle path. To do this we draw a line parallel with the occlusal surface of the lower base plate about one eighth of an inch below the occlusal surface. Now, we draw another line parallel with the slot on the articulator. You will notice that this is a "New Century Articulator." To secure this parallel line I have used a painter's graining comb with an attachment which fits into the condyle slot. We take this grainer's comb and fit this little attachment into the condyle slot. This will then give you several parallel lines. Select one of these and draw a line on the wax, so that it registers a parallel line in the region of the distal surface of the second molar. Bring this line down until it intersects the occlusal plane line that we already have here on the lower base plate. Take a pair of small calipers, such as these, and place one point at the intersection of these two lines, and the other point or leg of the caliper place on the condyle slot line just above the occlusal surface on the upper base plate. Set the calipers and move them around, placing them on the occlusal plane line, using the point of the intersection of the two lines as the radii. Then connect these two points with a straight line. Now, this straight line represents a compensating curve line. Then take a hot spatula, cut down this line and the portion of the wax that is cut off from the lower base plate, wax on to the upper, so that there need be no loss of wax, and all the time the line may be definitely established. You doubtless understand that while this line is a straight one, yet you can carve the wax from the distal part of the plate to the region of the cuspid eminence so that it will form the arc of the circle that represents the compensating curve for this particular case. Remember that this same curve must be worked out on the opposite side the same as we have on this. Now, at first thought it would seem that this is not exact and while there will be some uneven places on the occlusal surface of the base plate, in order to overcome this and to work out to perfection the compensating curve, dust white powder on the occlusal surface of the lower trial plate and then move the upper trial plate laterally on the lower and continue to carve the upper and also the lower until there is perfect contact between the upper and lower base plate wax in any position in which the articulator may be moved. Upon the degree of care taken in finding this exact curve will depend the success of the finished plates, for when we come to arrange the teeth on the base plates these occlusal planes represent the tips of the cusps of the lower and upper plates.

In selecting the teeth for this case it is very essential, unless you want to do a great deal of grinding, that you select some of the better anatomical molds of teeth that are now on the market. I take it that most of you already know the importance of securing a tooth of proper shade or color, so that the teeth will be in harmony with the temperament of the patient. In the past our profession has been too careless in selecting teeth. Some of the manufacturers have worked out a very unique system of selecting these teeth and it will pay any dentist to read their book of instruction.

Now, after your compensating and lateral curves have all been worked out and you have secured the teeth that you intend to use in this case, begin at the median line and set the right central first and all you need to do is to carve out the wax with a warm spatula and inlay the central into the wax so that each incisal is in contact with the incisal margin of the lower base plate wax. Continue the same operation with the lateral and cuspid, incisors and also the bicuspids and molars. After you have completed the right side then continue the same operation on the left side. Remember that the lower base plate serves as a guide for the position of not only the edges of the central incisors, but for the bicuspids and molars. If you have carefully worked out the compensating and lateral curves, the bicuspids and molar cusps should be arranged so that they come in contact with the lower base plate wax. In placing each tooth in position the articulator should be moved laterally and then you should notice carefully to see that the various cusps are in contact while the articulator is being moved.

In arranging the lower teeth on the base plate I would advise you to begin on the right side with the second bicuspid. Carve out the wax and fit it into position and test it with the lateral movements of the articulator to see that the cusps are properly placed in position.

Right here I would like to say that I notice a tendency on the part of beginners in this work to get the lower bicuspids too high. Remember that the plates when moved laterally and the teeth are being arranged that in the lateral movements the occlusal surface of the base plates should remain in contact. Continue this operation and fit all the teeth in place on the right side and then set up those on the left side, beginning with the second bicuspid. Again I would like to repeat that you want to continually test their lateral contact. After these teeth are in place then the lower cuspids and the centrals may be arranged in their positions. After the teeth have been set up in the wax, then with a hot spatula wax the pins thoroughly to the base plate and then you may use carbon paper and move the articulator laterally and with a carborundum stone remove the high spots. After this has been thoroughly done, take soap or oil and carborundum powder and place on the teeth and by the lateral movements of the articulator polish and grind the cusps of the teeth until they articulate perfectly.

I have found it a good plan after you have proceeded thus far to take the dentures and place them in the mouth and let the patient try them and then you can prove your work by testing them for lateral and protrusive occlusal. I have even permitted some of my patients to wear these plates for several days.

For flasking you can remove the casts from the frame and place them in the flask the same as for any vulcanized plate. The remainder of this work is the same as you are all familiar with, so that I will not take your time to go into details in the finishing of the plate. I am sure that some of you think that it is useless to put so much time on your plate work, but it has been my experience that people who live even in country towns are perfectly willing to pay for teeth that restore the natural functions of the masticatory apparatus and also the natural contour of the face. No dentist will have any trouble in securing a fee commensurate with the service it takes to render such work. The patient will appreciate the work that you are doing and will be perfectly willing to pay the price; especially have I found this true with people who have had trouble with plates made that have been set up on the plain line articulator, and you yourself will be surprised in placing plates in the mouths of patients set up by the anatomical method. It will not be necessary for you to pray for the plates to stay in position until you collect your fee, but on the contrary it will be almost impossible to dislodge these plates, if you have what is known as three-point contact, which makes them almost impossible to dislodge in the mouth.

A great deal of the work that has been done in the dental profession in the making of artificial dentures has been a disgrace to us, and the time has come when it behooves every dentist to take special pains and endeavor to give to humanity work that will not only be satisfactory to the patient but will raise the standard of dentistry to a higher plane of usefulness. I want to repeat again that you need not worry about the fee—your patient will pay the price if you are able to deliver the goods.

PRESIDENT'S ADDRESS*

BY DR. WILLIAM A. GIFFEN, DETROIT, MICHIGAN

AT OUR LAST ANNUAL MEETING, Dr. M. L. Ward, in his President's Address, clearly demonstrated that the progress of the Michigan State Dental Society, especially since its reorganization, was about all that its members had a reasonable right to expect.

I believe that an unprejudiced analysis of this meeting will prove that this society has more enthusiasm, more efficient energy, and is a more potent factor for dental progress than ever before, but while the record of this society to date may be declared satisfactory, and its future full of promise, the question is, "How are we to utilize our forces in order to accomplish the greatest good?"

Harmony is the most essential requirement, as internal dissension will wreck any institution, and the probabilities are that this society would not prove an exception to this general rule.

Another requirement which is just as important is efficient management of the society. In other words, the members should interest themselves in the election of officers to the extent that they will vote for the election to office those men only who have a record for doing a good deal of splendid work in their local society, and who have the endorsement of the ex-presidents and others who know the importance of the work to be done.

I would also add that there should be no hesitation in not re-electing or promoting an officer who has failed or neglected to fill to the best of his ability any position which he has agreed to fill by accepting a previous election. Our organization is bound to wield considerable influence for the future welfare of the people of this state, but we must pull together, as it is only through association and a thorough filtering of ideas that we may acquire the executive ability as an organization that must be respected in order to accomplish the best results.

We should have a membership of eleven or twelve hundred, and I am firmly convinced that we shall have over one thousand members in three years, provided the membership committee adheres to the same policy in the future that they did this year. Therefore I would earnestly urge the next president of the society to continue the present chairman of the membership committee in office and that the council furnish him with the

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***Read before the Michigan State Dental Society, 1914.**

necessary funds to carry on the work of demonstrating to the individual dentist what he can do for the society, what the society can do for him, and what both together can do for humanity.

The problem of creating more interest and better organization in the district societies is a perplexing one. However, I believe that Dr. Ward's idea of forming one or more study clubs in each district society would solve it. There is no reason why each of these societies should not have a post-graduate course for its members.

For instance, we will take two departments of dentistry which are most neglected, viz.: occlusal restoration and root canal preparation and filling, and have the president of each district society select from among its members six or eight who would work out the best technic for restoring the occlusal surfaces of teeth with the various materials, and six or eight others who would work out the best technic for preparing root canals, and filling them, and then demonstrate their findings to the other members of the society. The next district might take up other things in the same way; then when our state meeting is held we would have a truly scientific program and each district would be an important cog in this machine.

Study clubs in the district societies would not only greatly benefit this organization by the results of their work, but they would afford opportunities to the individual members who would compose the clubs to learn to practice the golden rule.

Again, we know that even mediocre ability, when developed and well trained, will produce a larger tree of success than will extraordinary ability, scattered or uncared for.

It is what we do with what we have, as much as what we have, that counts in every line of accomplishment. Success in our case, whether we possess great or little ability, consists in making the best of what we have, of doing our best with it, of reaching the highest within the range of our capacity; we can do no more and we should do no less.

Regarding the status of our co-operation with the medical profession in matters that should be of mutual interest and for the good of the laity, I believe some progress is being made, due no doubt, largely to the work and writings of such men as Bunting, Brophy, Kirk and others, but before conditions will be very much improved along this line I believe the concensus of opinion among the thinking men of our profession is that the dental profession must know more general pathology and the medical profession must know more dental pathology.

The proposition of our affiliation with the National Association will be taken up at this meeting. We have invited Dr. Homer C. Brown, of Columbus, Ohio, who is president of the National Association this year, to attend this meeting for the purpose of explaining the plan of organization to us; therefore, I shall not discuss the proposition further at this time, except to say that I hope there will be no opposition to the resolution when it comes up, that it will be adopted unanimously and give you just a few general reasons why we should become a state component of the

National Society. The National Society is a going concern. It has no watered stock. We shall all be preferred stock holders. No person can prevent us from criticising the management. We cannot be frozen out. We may get out when we choose. I believe we shall get the best returns in the way of condensed dental knowledge our chosen profession can produce at the minimum cost.

It certainly is a good business proposition and about all of our members who have given the proposition careful consideration have, for some time, been in favor of taking this action.

You will notice that according to the program of this meeting the subject of mouth hygiene is to receive considerable attention. A sufficient amount of work has been done in this state to establish its importance. In fact, the results accomplished in Detroit alone are attracting world-wide attention. This work should be taken up systematically by this organization in every district in the state.

I believe we have a grand opportunity to accomplish a vast amount of good for the rising generation. In the future it will be a greater pleasure to practice dentistry when a majority of the people fully appreciate the value of good teeth and a healthy mouth. The important point is how to educate the people in this mouth hygiene campaign.

In many places in Michigan there is a real genuine demand for lectures on mouth hygiene, clinics for the poor in the industrial cities, and dental inspection. In many localities there are no funds with which to agitate the need for this work. Very frequently where a local dentist gives a lecture on mouth hygiene, his fellow practitioner charges him with having selfish motives, and further they are in neither the possession of the necessary data, nor have they slides or suitable charts or lantern to properly illustrate the lecture.

Frequently dentists refrain from agitating this question through a desire on their part not to have the publicity which is inevitable. A practical man of experience properly equipped to give these lectures and operating under the State Board of Health would be a most effective means of putting these propagandas before the people. Many towns and cities would be calling for his services. As a representative of the State Board of Health, he would have prestige, and what he would say would be authoritative. Speaking directly to school boards and the children there would be a great amount of direct benefit derived and it would help to pave the way for dental inspection and in the industrial center for the clinic for the poor children.

Superintendents of schools throughout New York State are extremely enthusiastic over Dr. W. A. White's work and where he has been they want him again. In Michigan there is a real genuine demand for such a lecture and the agitation for the creation of such a lectureship should properly start with the state society.

In conclusion, I wish to thank the officers and members for their loyal support during my year as president, and hope that our relations will be just as cordial in the future as in the past.

PRESIDENT'S ADDRESS*

BY W. M. RANDALL, D.D.S., LOUISVILLE, KY.

IT GIVES ME PLEASURE—far more than I shall be able to convey to you in words—to introduce these remarks with an appreciative acknowledgment of the high honor which you conferred upon me last year by electing me to the highest office within your power to bestow. The office of president was conferred upon me by the unanimous vote of this body after thirteen years of active service. To preside over your deliberations at this, the forty-fifth annual meeting of the Kentucky State Dental Association, therefore, is more than an ordinary event to me. It marks an epoch in my life, and is, in fact, the highest honor I ever have received from the dental profession. I would like you to know and feel that I esteem this event very greatly, and with all my heart I thank you.

PROGRAM

Your officers and committees make a considerable effort each year to arrange a program of superior merit, always selecting live subjects, such as are attracting the attention of the thinking minds of the profession, with the hope of ever increasing your interest and offering you greater opportunity for profit. It is an arduous task to successfully arrange and stage so large a meeting as this. It requires much time, work, patience and the exercise of good judgment on the part of every officer and committee.

I know that the executive committee particularly has made an extraordinary effort this year with the result that it has arranged a program of unusual significance and merit. The systematically arranged schedule of twelve to fifteen lectures in post-graduate work, together with the clinics and symposiums of subjects for the general sessions of the meeting—both by local talent and by men of national reputation, from various parts of the United States, I am sure will make this one of the most profitable meetings the society ever has had.

I, therefore, take this opportunity in behalf of the members of the society to thank each one of the officers and committeemen for the sacrifices he has made, and the effective work he has done in arranging this meeting.

Article 2 of the constitution and by-laws of this association says: "The objects of this association shall be to *cultivate* the *science* and *art* of dentistry and all its collateral branches, to *elevate* and *sustain* the professional character of dentists, to promote among them *mutual improvements*, social intercourse and good feeling, and to collectively represent and have cognizance of the common interest of the dental profession in the state and to enlighten public opinion as to the objects and benefits of the dental profession."

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*Read before the Kentucky State Dental Association, Louisville, 1914.

The feature of the post-graduate course is by no means a new one in connection with the state association. A systematic course of study under the auspices of the Illinois State Society was begun, as most of you remember, some six years ago by a systematic classification of subject matter, and a true indexing of the same, as presented through the various dental journals. The idea was a good one, but it met with only a partial success.

The busy dentist either does not have the time, or, when his day's work is over, does not have the inclination to follow a prescribed course of study outside of current news or professional literature of the present day needs. What he wishes is personal contact with teachers or authors who are filled with personality and enthusiasm on their subjects, thereby stimulating himself to a greater interest and a broader aspect of his professional usefulness.

Some ten to twelve state dental societies have tried the post-graduate feature and in no instance has it not met with the enthusiastic approval of its members, and they are crying for more and are repeatedly having programs of a similar nature.

Then, with the idea of cultivating the science and art of dentistry to a higher standard of "service" and for the greatest amount of mutual improvement with the minimum expense, our officers and committeemen have given us the post-graduate course of lectures and clinics in addition to the general session this year. No member can afford to miss this opportunity. Let every one in attendance, both visitors and members, make application to the secretary and qualify for this course. It is not arranged for dental students just entering their course of study, but for *men*, busy *men*, in the practice of dentistry, who want the shorter, better and more efficient methods of increasing the value of their "services."

REORGANIZATION OF THE NATIONAL DENTAL ASSOCIATION

Kentucky has for many years in the commercial, social and educational world, held a reputation for its conservatism; this reputation certainly has been fulfilled respecting the plan of the reorganization of the state dental association into component societies, begun five years ago, and today with regard to our affiliation with all the other state dental societies in the reorganization of the National Association, the new constitution and by-laws of which were adopted at the last annual meeting, held at Kansas City in June, a copy of which you have received, and the import of which is to the effect that each state society by the necessary official action, become a constituent of the National society, which will entitle them to representation in the house of delegates—the executive body of the National, upon the following conditions:

That one delegate shall be allowed from each constituent society, and each constituent society shall be entitled to one additional delegate if one hundred of its members become regularly enrolled as members of the National Association, and one more delegate for each additional two hundred members enrolled.

There are about 750 reputable dentists practicing within the borders of our "Grand Old State," and yet if this body were to take official action tonight, we would only have a representation of two delegates to the National in business matters, as we have only about 235 members of our enrollment of about 435 who have qualified either through the component societies of which they are members or direct to our secretary.

Fellow members of this association, the time has now arrived for us to break away from our too conservative policy. Let's awake from our lethargy and take official action to become a constituent society of the National, and thereby by the payment of $1.00 annual dues, secure all the privileges of the regular members of the National Association and the dental journal, to be published under the auspices of that body. These dues are to be paid either the component society of the state association or direct to the secretary of the state society; the state association being directly responsible to the National Association for the national dues of its members.

I certainly recommend that the committee on amendments to our by-laws submit such changes in our present constitution and by-laws as will enable this body to become a constituent member under the new constitution and by-laws of the National, now passed, and full consideration of same can be made in black and white. Every state association in the Union has become a constituent member except two, of which Kentucky is one. Why *not* Kentucky?

COMPONENT SOCIETIES

You will agree that this is indeed a broad platform The most progressive kind of a program. Have we fully met this standard? Have we, as a society, done our very best to bring into active membership all the members of local societies and thus strengthen our position in this state by presenting a united front in all matters respecting the welfare of our people and our profession, and thus show as we should show, a membership of ninety per cent. of all the ethical dentists in the state? Many of our active workers have spent much energy and time to improve our conditions but the result has not been what we had a right to expect. There are still too many societies satisfied to do a local work and have not been aroused by us to take an interest in the work that this society is trying to do. These societies to whom I have made reference should adjust themselves to the changed conditions under which we are now living, apply to this society for a *new* charter, awake to the great possibilities now before us and them, and thus extend their influence and activities to a state and national field. A new field is open. It is my firm conviction that the time is near at hand when life insurance companies will quite generally require dental inspection in addition to the medical inspection demanded of all applicants for life insurance. It is now recognized by the leading members of the medical profession that a clean mouth and sound teeth are important factors making for longevity. We should more fully realize the true significance of the work that is being done along these lines. I recommend that during the next year this society take the necessary steps to plan a movement that shall reach into every city, town and hamlet, and that an opportunity be given to every ethical dentist in this state to become a member of this society, with a view of bringing the active membership up to the 600 mark and thus increase our efficiency as public servants and our usefulness as a society.

HEALING ART

Dentistry strictly belongs to the "healing art" as well as the skill of constructive genius. During the past two years much publicity has been given to the statement of Dr. William Hunter, eminent physician and pathologist at Charing Cross Hospital, London, to the effect "that dentistry as practiced by some able men, especially in America, is spreading deadly maladies not only among the moderately well-to-do, but among the very rich;" and of Dr. Chas Mayo, one of the most eminent surgeons of this country, in his masterly paper on "General Systemic Disturbances," read before the Chicago Dental Society last year, which attracted a very large representation of progressive medical and dental practitioners from all parts of the United States. In closing, the doctor made the significant remark that "it is evident that the next great step in medical progress in line of preventive medicine should be made by the dentists." The question is, "Will they do it?" Our profession in America should not receive these criticisms with a frenzied outcry of denial, but instead give thoughtful consideration and study them. The charges made have been exaggerated, I will not deny. We need to be reminded that dentistry is founded on Anatomy, Physiology, Chemistry, Pathology, Bacteriology, and collateral sciences. Let us take an inventory of our own professional equipment for the work of saving the health of those who are entrusted to our care. If we will do this earnestly and with courage, then sepsis and auto-intoxication resulting from dental operations will be limited to those who practice dentistry merely for the money there is in it, and without due regard to the health and happiness of their patients.

PREVENTIVE DENTISTRY

We are told that there are in the United States more than twelve million school children who are suffering from physical defects which can be traced directly to neglected teeth. The exact number, of course, is immaterial. The important point to remember is that the statement is in fact true. It also seems to me as entirely proper to remind you of the report of "Russell Sage Foundation," which, as you know, is a commission founded for the purpose of making a special study of the diseases of old age. The report made by this commission is to the effect that most of the diseases of old age have their origin in the long continued lack of a good masticatory apparatus, and in the neglect of the teeth in middle life. It is at least a conservative statement to say that mouth hygiene does not represent a theory; it is a movement for the betterment of the physical and mental condition of the human race. Surely this is a work which is worth while, and the contemplation of which should inspire us to a mighty effort to improve our knowledge and to perfect our skill. Many suggestions to this end have been offered. Those which appeal to me most and which I will mention briefly are: *First*, the instruction of the patient in the chair in the care of the teeth *by the dentist*, beginning, if possible, in early childhood. *Second*, a systematic and helpful spirit of co-operation with the family physician. Preventive medicine and modern dentistry should go hand in hand. Encourage the physician to look for diseased teeth, diseased gums, etc., as well as a coated tongue or inflamed pharynx. The members of the dental and medical profession should join their efforts in their battle with disease. *Third*, the work of the post-graduate courses on the various specialties of dentistry, to those who desire to become more proficient and skillful along special lines. Learn methods more up to date. The work which the dental societies and the dental journals of this country are doing should meet with greater encouragement in our state. It is the key to all post-graduate work and must not be neglected in the progressive health campaign in which we are engaged.

Fourth, publicity. Last, but by no means least in importance, is our attitude toward the press of the country. I am ever tempted to urge that it is of first importance, now, because most neglected. The newspapers and magazines published in the United States are for the most part leading the way in progress by giving publicity to those things which have a direct bearing on the health of the people. If the newspapers of Kentucky have in the past not given due credit to the work of the Kentucky dentists, and have occasionally referred to us as "tooth-pullers" and "tooth-carpenters," then it is our own fault, not theirs. I fear that we have been hiding to some extent, at least, behind a false standard of ethics, deceiving ourselves with the mistaken idea that publicity given to what we know as professional men would be advertising and therefore not ethical. If this were self exploitation, it would be advertising, and therefore not compatible with our high calling as practitioners of the healing art. Such publicity, however, which finds its motive in the desire to improve the general health of a community, need not and should not be given with the idea of self exploitation. Forget self, give the press the facts relative to your work, and you will find the newspapers of Kentucky more than willing to do their full share of the work which falls to them as guardians of the public health.

It is silly and foolish to call that kind of publicity advertising, because the people whose servants we are, have a right to know whether or not we as a society and as dentists are making progress in the discharge of our duties, as men and as dentists.

PROSTHODONTIA

While educating the child and youth to prevent dental maladies and how to preserve their dental organs to the age of three score and ten, the fact still remains that a great number of the laity past middle life, as reported by the Russell Sage Commission, are suffering from diseases due directly to imperfect mastication. In a great majority of these cases, their infirmities are due to either the absence of natural teeth and their occlusion or the inefficiency of artificial dentures.

It appears to me that the profession as a whole has sorely neglected the science and art so essential to the best service, in this very important branch of dentistry. There is an entirely new era upon us in the realm of denture construction. The technic of "Anatomical Articulation," as has been known as the "Twentieth Century Method," and as is now being introduced to the profession by Prof. Gysi, should be thoroughly understood and mastered by every ardent worker in the profession who aspires to render best service possible. It is not beyond the possibility of the busiest practitioner nor the most amateur of the profession. It can be mastered by all with less effort and time than is sometimes used in attempting to perfect occlusion of dentures by grinding after they have been finished. When it has been proven by actual tests that the masticatory stress has been increased from 30 to 60% by this method and that even then the case is only 50 to 60% of what it is in the jaws of natural teeth, it should behoove us not to be satisfied with anything less than that which will render the greatest efficiency and hence prolong the lives of those thus afflicted and make their lives happier and more useful while they do live.

Leon Williams, of London, England, who has been making investigations during the past eight years, is to introduce within the next sixty days, through the Dentists' Supply Company, an entirely new and strictly scientific and simple plan for the selection of forms of artificial teeth; of all the forms and all sizes of teeth the manufacturer of teeth will only be required to keep twenty-seven molds. I do not think any dentist can afford to overlook the study, as well as the practice, of Dr. Williams' method in selection of all artificial crowns and teeth. The steps of progress in prosthodontia during the past five years have been just as great and just as important in that branch of dentistry as cast inlays, nitrous oxid and oxygen, etc., have been to operative dentistry.

I most heartily recommend these advanced methods of practice—not theory—in prosthetic dentistry, to all. It is not a question of time as much as a question of *Efficiency of Service*. Learn it now!

A CORRECTION

The third sentence in Dr. L. P. Haskell's article, "Nature's Handiwork in Human Teeth", page 71, January SUMMARY, should read: "A circle made of these is set on the incisors; a line through the center of the circle will pass through the center of the *second* bicuspids", etc., instead of *first* bicuspids, as it appears.

REPORT OF THE COMMITTEE ON DENTAL SCIENCE AND LITERATURE*

We, the committee on Dental Science and Literature, beg leave to submit the following report. I wish to divide my subject under several heads: Castings and Inlays; Prosthetic Dentistry; Orthodontia; Radiography; Pyorrhea; Miscellaneous, and last but not least, the Business Side of Dentistry.

CASTING

Under the head of Casting I find two interesting articles, "The Cast Gold Inlay and Its Advantages," by Dr. A. J. Bush, and "The Technic of Casting," by Dr. Thomas J. Hinman, both in the SUMMARY, February, 1914.

PROSTHETIC DENTISTRY

Cosmos, April, 1914, two articles: "Taking the Occlusion" and "Registering the Condyle Path," by Dr. Amoedo, Paris, France. "Tubeless Teeth in Prosthetic Work," by Dr. Elphanstone, Aberdeen, Scotland.

ORTHODONTIA

I find a very interesting series of articles by Dr. Bogue, in the *Digest* of 1913, on "Orthodontia of Deciduous Teeth." *Cosmos*, September, 1913, "The Rational Treatment of Infra Occlusion," by Dr. Young, and "Orthodontia and Its Relation to Dentistry," by Dr. Day. *Cosmos*, February, 1914, some experiments on animals by Dr. George V. I. Brown, on "Studies in Upper Maxillary Contraction and Expansion." Also "Anomalies of the Jaws and of Malocclusion," by Dr. Tandler. In *Cosmos*, May, 1914, "Treatment of Malocclusion," by Dr. Butler.

RADIOGRAPHY

Cosmos, January, 1914, "Dental Radiography," by Dr. Mackee. *Cosmos*, May, 1914, "The Roentgen Rays in Dentistry," by Dr. Van Allen. *Cosmos*, September, 1913, "Dental Radiography," by Dr. Moffitt.

PYORRHEA

Digest, September and October, 1913, "Systemic Effects of Pyorrhea," by Dr. Nodine. SUMMARY, September, 1913, "Instrumentation of Pyorrhea," by Dr. James. *Cosmos*, November, 1913, "Operative Treatment of Pyorrhea," by Dr. Hartzell. *Cosmos*, March, 1914, "Prevention of Pyorrhea and Dental Caries," by Dr. Skinner.

MISCELLANEOUS

Under this heading I find several articles on diverse subjects in which I think the profession will be especially interested.

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*Presented at the Indiana State Dental Society, 1914.

Among others is an article in THE DENTAL SUMMARY for April, 1914, by Dr. Hogan, on the work of Dr. Fitzgerald on "Local or Inhibitive Anesthesia." This is apparently a new subject and one which will be of increased interest to the profession at large.

Another interesting article is "The Saliva and Dental Caries," *Cosmos*, March, 1914, by Dr. Bunting, a part of the work of the National Research Committee. In *Items of Interest*, January, 1914, the inauguration of a serious effort to establish a dental school of education for dental hygienists, referring to Dr. Fones' school at Bridgeport, Conn.

Another article of special interest is by Dr. Grieves on "The Teaching Value of the Clinic," *Cosmos*, April, 1914.

Another, *Cosmos*, May, 1914, also from the pen of Dr. Grieves, on "The Responsibility of the Dentist in Systemic Diseases," arising from dento-alveolar abscesses. This is certainly a well-timed article.

Cosmos, November, 1913, along the same line is "The Responsibility of the Dentist in Oral Malignancy," by Dr. Crane. Another, "The Dentist's Relation to Oral Cancer," by Dr. Macey.

I also note three interesting articles: "The Use of Vaccines in Acute Oral Septic Conditions," *Cosmos*, January, 1914, by Dr. Madalia; "Vaccine Therapy in Pyorrhea," SUMMARY, September, 1913, by Dr. Armitage, and another interesting article on "Vaccine Therapy," SUMMARY, March, 1914, by our well-known Hoosier, Dr. Laymon.

I note in the foreign journals quite a bit of literature along experimental use of radium therapy in pyorrhea and oral diseases, especially from German and French dentists.

I also note an interesting article on "Diseases of the Dental Pulp," by Dr. Tileston. *The Dental Digest* prints a series of interesting articles from Dr. Lederer, on the principles of tooth extraction, which is well illustrated.

The Dental Cosmos, February, 1914, has several interesting articles, one on "The Etiology and Progress of Dental Caries," by Dr. Coolidge; another on "Experimental Lines of the Relations of the Sulpho-cyanate to Dental Caries," by Dr. Gies.

Cosmos, March, 1914, "Fixations in the Treatment of Fractures of the Mandible," by Dr. Ivy. "Etiology of Dental Caries," Dr. Kirk.

Another interesting article from the pen of Dr. Grieves on "Dental Periapical Infection."

The SUMMARY of September, 1913, presents an article by Dr. Prinz, "Diagnosis of Diseases of Dental Pulp."

Dr. Black has an article in *Cosmos* for December, 1913, on "Early Pathology of Pericemental Disease."

Dr. Leon Williams has a series of interesting articles in the *Digest* on "The Temperamental Selection of Artificial Teeth."

The *Cosmos* of September, 1913, has an article by Dr. Bunting, "The Effects of Depraved Oral Conditions Upon Nutrition." The *Cosmos* of

November, 1913, has an article from Dr. Grieves on "Infections Resulting from Lowered Vitality, Caused by Unhygienic Mouths."

SUMMARY, March, 1914, "Diagnosis and Treatment of Maxillary Empyema," by Dr. Graham. *Cosmos*, November, 1913, "The Saliva," by Dr. Howe. "Oral Prophylaxis," *Cosmos*, April, 1914, by Dr. Filbert. I find one interesting article in *Cosmos*, September, 1913, by Dr. Van Woert, "Porcelain in Dental Art."

Cosmos, April, 1914, "Root Preparation," by Dr. Orton. *Cosmos*, October, 1913, "Structure of Enamel," by Dr. Pickerell. *Cosmos*, October, 1913: An old subject brought up again in "Non-Cohesive Gold Filling," by Dr. Sweeney.

SUMMARY, January, 1914, "Impacted Third Molar," by Dr. Lyons.

I find another interesting article on "The Higher Art in Amalgam Filling," *Items of Interest*, January, 1914, by Dr. Pond. This article is a reaction from the use and abuse of modern gold inlays.

It is with a great deal of interest that we note the use of radiographs, illustrating the various phases of dental work and diagnosis. This work is making plain a great many of the obscure problems which formerly were represented by diagrammatic sketches, and certainly gives to the busy dentist a better idea of what can be done in certain obscure cases, especially in the relations of impacted teeth, chronic abscesses, punctured and abscessed roots, and in empyema of the maxillary sinus.

And last, but not least, in the part of dentistry that most vitally concerns the dentist family, his future and well being, is the subject of

THE BUSINESS SIDE OF DENTISTRY

The Dental Cosmos takes up an article by Dr. Kent on the "Scientific Management Applied to Dental Practice." This is along somewhat different lines than the work that has been undertaken by *The Dental Digest* in its special phases of business management.

I note with pleasure that Brother Bill continues to hammer along his old line and with more emphasis on certain points. There is also in other of our leading magazines more interest being paid to this most essential side of the dentist's welfare.

BOOKS

Now, under the head of books, Dr. J. B. Winters, of St. Louis University, has written a very fine book on the subject of Exodontia. It is certainly well illustrated and finely gotten up and is a valuable treatise to either the beginner or a student of extraction. I cannot say, however, that I like the title of the book. It does not express altogether the meaning of the work.

Another book published in England by Dr. Ernest Sturridge on "Dental Electro-Therapeutics." I note also with pleasure the fourth edition of the "American Text of Prosthetic Dentistry," edited by Dr. C. R. Turner. Also the new American edition of Gray's "Anatomy," by Edward A. Spitska.

Our well-known Hoosier, Dr. Howard R. Raper, of the Indiana Dental College, has finally completed his most excellent work on "Elementary Dental Radiography," which I see has been adopted by the dental faculties as a text book. The Indiana Dental Society is certainly to be congratulated on the reception given this first text book, published on a subject which is practically a new one in dental colleges. We note by our current literature for the last year that this subject is being studied more and more by the profession, and it certainly reflects great credit on the author, the Indiana Dental College and our State Dental Society.

Respectfully submitted,
A. B. Price,
A. A. Spears,
J. E. Bowyer,
Committee

USE OF SOFT GOLD*

BY DR. F. R. HENSHAW, INDIANAPOLIS, INDIANA

No. 4 soft (non-cohesive) gold was rolled into cylinders and introduced into four-walled cavities, into which is first carried a thin mix of cement. The cavity is completely filled with the cylinders, stood on end and packed into position. The final wedge-lock being forced into same space near the center of the filling. Before the cement begins to crystallize, the entire mass is packed and compressed in the direction of the long axis of the tooth. After the cement has fully set the filling is trimmed with plug finishers and fine stones and the surface burnished to a perfect restoration. This method gives the perfect sealing of an inlay with all the well-known advantages of the soft gold filling. It is particularly adaptable to children's teeth where fissures must be cut out and filled, as it calls for the least possible sacrifice of enamel and may be done without the use of the rubber dam.

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*Office clinic, Indiana State Dental Society, 1914.

The key was love; pure gold, acrust
With glittering gems of faith and trust.
It fits all doors, it turns all locks,
It leads the way through walls and rocks,
It lifts the bolt, unbars the gate,
And shows us where life's treasures wait.

HEALTH CONSERVATION

MOUTH CONDITIONS AND THEIR RELATION TO PUBLIC HEALTH*

BY VICTOR C. VAUGHAN, M.D., ANN ARBOR, MICH.

PRESIDENT AMERICAN MEDICAL ASSOCIATION.

THE AMERICAN MEDICAL PROFESSION, representing some sixty thousand doctors, poor doctors financially, not professionally, are spending $70,000.00 this year in trying to teach the people of the United States how not to get sick. I was at a meeting of the Board of Trustees a few months ago, when we made that appropriation out of our hard-earned wages. Sixty thousand doctors in this country are paying $5.00, and we are running a medical journal, and we appropriated $70,000.00 this year to be expended in sending men about to lecture everywhere and anywhere, telling people how not to be sick. Now, many years ago, we had a governor of Michigan. Of course, he was a democrat. Some of the best governors have been democrats. This governor, long, long years ago, addressed a meeting of the American Public Health Association in Detroit, when he spoke to doctors gathered from all parts of the country, to talk about preventing sickness, expressed his high appreciation of their work. He was a man said to be illiterate, but he said many bright things. He was a great man, and there is no objection to telling his name. He said: "If, during my official career I should be called upon to meet in a convention of lawyers who had met to prevent the arising of litigation, then I would say with Simeon of old: 'Lord, let Thy servant depart in peace, for mine eyes have seen thy salvation.'" That was the governor who first appointed me on the State Health Commission. Gov. Ferris made the last mistake. Every now and then I receive a letter saying, "I want a position in the office of the State Board of Health. My father served the republican party for so long, or he edited a republican paper," etc. My stereotyped reply is, "I am glad to know of the distinguished service your father rendered the republican party. I am a democrat, always have been and always will be."

When we go before the people and say that the medical and dental professions are interested in preserving health and preventing sickness, we are met with a stare of unbelief. People do not believe this. But what are the ultimate objects of medicine and dentistry, because dentistry is a part of medicine? The ultimate objects are to prevent preventable diseases, and to cure curable diseases while they are still curable. These are the things that we want to do. Now, I have been interested lately in looking up one special subject, and there are two or three things along this line that will interest you. I have been studying the influence of disease on progress of civilization, and I find that the testimony that disease has blotted out the civilizations of the past is strong, the testimony is irrefutable. The people of ancient Egypt at the time of the Pharaohs had wise laws; they drained their soil; they carried on an extensive line of agriculture; they reared cities, built sewers, brought in water supplies; in fact, the historian of that time says their laws and regulations read as though they had been written by a wise physician, rather than by a law giver. And we know that Moses, learned, as the good book tells us, in all wisdom of the Egyptians, was wise enough to codify his sanitary rules and regulations in the form of religious rites and ceremonies, and in that way he secured their adoption even down to the present time by the orthodox Hebrew. Greece built up the greatest civilization of past times, because it was the most scientific nation. But about 500 years before Christ, in one of their expeditions into Africa, they became infected with malaria, and carried it into Greece, and from that day on malaria has held Greece in bondage, and within 50 years after the introduction of malaria into Greece, its august civilization began to decline. How can you expect people to be civilized, intellectual, progressive, or anything else, when men, women and children have the malarial parasites in their bodies? After Greece, the broken remnants of civilization settled in Italy, and for a time it seemed that the Roman empire would extend all over the world. But in the second Punic war with Hannibal, in Africa, the malaria was introduced into Italy. Then came the plague, and the august civilization of the wide empire of Rome went to pieces, simply because disease swept it out of existence. Within one year one-half of the people in all the Roman empire died from disease, and the time came in Italy long after the Christian era when men and women ate their own children because they were diseased and degenerate and lapsed into barbarism. The distinguished historian Niebor says that there has been no great lapse morally or intellectually in any nation except as a result of disease.

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*An address before the Michigan State Dental Association, 1914.

Now, I believe that Gov. Ferris—and I know his sentiments and know how he has acted all the way in regard to health matters—is convinced and is right that the only way to keep a nation strong is to keep it healthy; the only way to keep a nation honest is to keep it healthy; the only way to keep a nation intellectual is to keep it healthy. Without health we cannot have any of these. Disease has blotted out civilizations in the past, and I am not so sure that it may not do so in the future. As a contemporary with Mr. Dowie and Mrs. Eddy, and as a resident of a country where the osteopath and the chiropractor flourish, I feel some embarrassment in speaking of the superstitions and ignorance of the Middle Ages. The behavior that was exhibited in this country in the Spanish-American war, when

20,000 of the 100,000 young men who enlisted came down with typhoid fever, simply due to the fact that the members of Congress would not make the proper appropriation for the army; the behavior of the state authorities of California two or three years ago when the plague occurred there; the behavior of the people whenever there is an epidemic, leads me to believe that with widespread disease among us, we would still revert to barbarism. In the last legislature we had a bill before the state legislature. Gov. Ferris was in favor of it, but the people of Michigan and the legislature especially had not gotten to that point. That bill provided that in every county of 30,000 inhabitants or more in the state, there should be a full-time health officer, who should give all of his time and energy, and have a laboratory and assistants, whatever help was needed, and who should know the healthy or unhealthy condition of every family in his jurisdiction. That bill has been up a year and a half in half a dozen states. The only state in the Union which passed the bill was New York. Now, New York is being divided into thirty sanitary districts outside of the city of New York, and a competent man is to be put in charge of every one of those districts, and he is to have abundant assistance and everything of that kind. Now, science is not going to do its greatest good for the people until the time comes when every man, woman and child in this country is examined once or twice a year, not for the purpose of curing them of some disease, but to see that they are healthy, that they are healthy in body, that they are healthy in mind. Crime is a disease. It is due to inheritance or environment, one or both. We know that there are children growing up in every town and village in Michigan under conditions where it is just as impossible for them to grow into healthy citizens as it is for oranges to grow at the north pole. In Ann Arbor, under the shadow of the University, there are children growing up in homes so unfit for children to grow up in that it is impossible for them to grow into good citizens. The only way to reach these people is to go to them and examine them, and find out what is the matter with them. It was my good privilege a little less than thirty years ago to study in the laboratory of Dr. Koch. I didn't dream at that time that I would ever live to see the day when fifty per cent. of the deaths from tuberculosis would be done away with. That has been accomplished in this country since 1880. The deaths from tuberculosis in the United States have decreased fifty-four per cent. At that time the average life was 33 years; today it is 50 years; and if the people of the United States were to follow out the directions which any group of intelligent doctors and dentists could lay down before them, within twenty years the average of human life in the United States would be 65 years. Is that worth doing? The average of human life in the United States has been increased four years in the last ten years, and still the death rate in Michigan is twice what it is in the Canal Zone. You may say that there are not as many children in the Canal Zone. That is true. But the population of the Canal Zone is made up largely of Jamaican negroes, ignorant people, and still the death rate in our country is twice as great among the negroes as among the whites. Still right here in Michigan, here in Detroit, the death list is 14 or 15 per thousand every year. It used, 100 years ago, to be 60 or 70 per thousand. Now it is 14. But the death rate in the Canal Zone, where everybody is looked after, where health is of paramount importance, the death rate even among the ignorant negroes, by whom a large part of the digging of the canal was done, is 7 per thousand. Just take one or two diseases. I remember, when I began the practice of medicine scarlet fever was one of the most dreaded diseases in Michigan. The doctor shuddered whenever he was called to a case of that. The whole neighborhood became excited, and soon we came to regard scarlet fever as a very dangerous disease. Fortunately, it is very easily recognized, and now every mother, as soon as she sees a suspicious rash upon her child, sends out a hurry-up call for a doctor. What is the result? We have come nearer to blotting out scarlet fever than any other disease. The death rate from scarlet fever in the United States, or in the registered area of the United States today, is one-ninth of what it was in 1880. Typhoid fever has been greatly reduced. Nearly all the diseases, except cancer and pneumonia, and possibly a few others, have been curbed. This is the work we are engaged in, doctors and dentists, and in behalf of the 60,000 doctors whom I represent tonight, I want to bid the dentists God speed on their way, and may we live to see the day when every man, woman and child in the country will be examined once or twice every year, both by the doctor and the dentist. The framers of the Ordinance of 1787 go back to the time when this whole Northwest was a wilderness, supplying a scanty subsistence to a few scattered tribes of savage Indians, and attracting to its borders only a few of the heartiest sons of civilization; those old men who wrote that Ordinance wrote into it "religion, morality and knowledge being necessary to good government and to happiness, the American schools and the means of education shall forever be encouraged." Let us write as an addendum to that famous document—"There shall not be in this, the great territory of the Northwest, now the center and heart of the United States, any disease which can be prevented, any suffering which can be allayed."

RESTORATION OF MARGINAL RIDGE*

BY R. L. CANINE

Ordinarily in making an inlay or a proximal filling, food is forced in between the teeth, no matter how truly the proximal contact is restored. If the filling is perfectly smooth, it forms an inclined plane that forces the food in between the teeth. By restoring the marginal ridge in all the posterior natural teeth, the food is cut, and instead of being forced down straight, such a small quantity goes in between the teeth that it does not cause any bad effects.

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*Clinic Kentucky State Dental Society, 1914.

THE ATTITUDE OF EDUCATION TOWARDS MOUTH HYGIENE IN THE PUBLIC SCHOOLS*

BY CHARLES F. CHADSEY, A.B., DETROIT, MICHIGAN
SUPERINTENDENT OF PUBLIC SCHOOLS

I WAS NOT ASKED to come here tonight to try to compete with the other speakers of the evening, but I was merely to come to express to you my appreciation of the work that the dentists of Michigan and of Detroit are doing, and perhaps to learn something myself. I am very sure that I have learned much, and I appreciate having had the opportunity of being here and of listening to these various addresses. I think that I am justified in saying that the Board of Education of Detroit is in the heartiest sympathy with the work of the dentists and of the physicians of the city in their efforts to bring about a better physical condition on the part of our young people. When certain of those slides were thrown upon the screen, I thought I was looking into the rooms of some of the Detroit schools, and in that connection I am very glad to announce tonight that we are having placed in all of the buildings which are to be erected in the future, well equipped clinic rooms, that is, rooms specially designed by the architect in preparing the plans, where we may have in every one of our new buildings these dental clinics. These rooms will also be used by the medical inspectors for their daily inspection of the pupils who are sent to them by the teachers. We do believe, as the speakers have told us we ought to believe, that the health of the child is of paramount importance, and we are trying in every way to foster that health. We are trying to make these new buildings just as healthful places for children to be in as we possibly can. We are trying to foster the idea of the open air school for our anemic children, for our tubercular children. We have had, as you know, for the last two years, through the generosity of others, a well equipped open air school for children of tubercular tendencies. We have had established in connection with the Kiefer Hospital this year a hospital school for children who have developed cases of tuberculosis, and we are just building three new buildings, which will be opened next September, on the roofs of which we have placed open air schools, where we will have a chance, in each of those buildings, for two schools, with the dining rooms and the rest rooms and the shower baths, and all of the equipment which is necessary for that kind of work. We are trying to meet that particular need, and this year, in the requests which are now before the Board of Estimates, we have included for all of the elementary schools that which never has been included before—I think to the shame of Detroit—gymnasiums for these schools. We hope that from now on all of our elementary, as well as our high schools, will be so equipped as to secure the development of the physical side of the child. I do believe that we are justified in saying that this co-operation is also found on the part of the teaching body of our schools.

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*An address before the Michigan State Dental Society, 1914.

Right here I would like to bear testimony to the good spirit of the Department of Health of this city, and the beautiful way in which they do co-operate with us in all of these matters. It is a debatable question, possibly, as to whether the department of medical inspection and dental inspection should be an integral part of the school system under the control of the Board of Education, or a separate body, as it is here; but I want to say that if in all the cities of the United States there was the same co-operation that exists here, I do not believe there would be any room for discussion at all. Certainly I see no occasion here to have conditions other than they are. We are getting that co-operation which is essential in work of this kind. I believe that the responsibility for this kind of work should be definitely fixed upon the department charged with the general health of the entire city. Only a few months ago, as the result of a suggestion of your Dental Association of Detroit, and through the active interest of one of your number, who happens to be one of the school inspectors of this city, the teachers were instructed to include in the regular marks which are sent home with the pupils, a mark as to the personal and the oral hygiene of the pupil. While I wondered somewhat as to the effect of this particular change, and as to the spirit in which this would be received by the patrons, I am very well satisfied now that that kind of work is helping, and we are accomplishing in that way some if the things which were indicated tonight; that is, we are showing in a very emphatic way to the parents of the children coming to the public schools, that there is something which must be looked out for in addition to the intellectual progress of the child, and that if the personal hygiene of the child is unsatisfactory, or the oral hygiene is unsatisfactory, there is something which needs attention just as emphatically as if the work in arithmetic or reading or spelling, or any other branch, is unsatisfactory. I had a number of indignant messages after the first reports were received. A number of parents were decidedly insulted, and came to see us concerning this departure. They said it was an outrage, and that the teachers should apologize to the parents for sending reports of unsatisfactory conditions. But I have noticed, on the other hand, that in many cases there has been very greatly increased attention given to those very things. And human nature being as it is, when the children discover that if those things are neglected there is going to be a mark of "unsatisfactory" on their report, which is otherwise spotless, there is apt to be some very strong pressure on the part of that child in the way of having these defects eradicated. We instructed the teachers that if the dental inspectors reported to them that there were faulty conditions in the mouth, until those faulty conditions had been corrected, and evidence that that correction had been made received through reports from the home dentist or from the dental clinic, the report "unsatisfactory" was to be continued. We are, of course, right in the midst of this experiment, and do not know how well it is to work, but I simply cite the fact that, thanks to your Association, we are going to emphasize those things more and more. We want to take forward steps every year in this work. We want to assure ourselves that by the end of each year we will have done something which brings about a better condition as to this whole matter of physical welfare. Like Gov. Ferris, I do not like to think of this with reference to oral hygiene alone. We want to develop the child in every way; we want to develop a body which is worth while, and we want conditions in this city which will make possible the development of the right kind of physiques on the part of our children.

I was greatly interested to learn, as I did a few weeks ago, that a very extended examination as to the physical condition of rural children as compared with city children showed most conclusively that with reference to almost every kind of physical condition the city child was superior to the rural child. I think most of us may be startled to realize that that is so, but it is so, ladies and gentlemen. I think it is due largely to the conditions indicated by Gov. Ferris, that in our cities we do have these active organizations, and do have more hygienic conditions in our schools; that we teach hygiene and sanitation in a more effective way, and emphasize it more; and that we have medical inspection, where we do not have it in the country. It is also true that city children are very apt to have medical attention more promptly than in the country. Dental hygiene in many cities has been emphasized, and the condition of the teeth of the city children is, therefore, better than the teeth of the country children, and therefore, as we have seen tonight, there is every reason to believe that the general physical conditions on account of all these reasons is superior. And we need to have hygiene and sanitation even more strongly emphasized. Gov. Ferris is right as to the need for greater emphasis on these subjects in the rural schools, and we in the cities are only at the beginning of the work. I am referring now to conditions far away from dental inspection. We must have a chance for our children to have play in the open air for if they do not have the chance to develop themselves in those ways, these conditions which we are priding ourselves on as cities, may not be maintained. We cannot maintain efficiency if we do not conserve the rights of the children for outdoor play. And there is where we need the help of this Association, and the help of all good people here, in bringing about such a sentiment here that we may have the playgrounds we need, the places for these open air schools and gymnasiums, and all the accompaniments and equipment in the schools, through which we may constantly and continually serve the physical side of the child. So long as we bear this in mind, so long as we are improving, so long, I think, we can see that our school system is bettering conditions generally. I am in sympathy with the notion that we cannot hope to have effective schools without the very best of physical conditions under which to work, and if we do not emphasize physical welfare, so that our children themselves may be in the proper condition physically, we are failing in our duty.

THE STATUS OF MOUTH HYGIENE IN PREVENTIVE MEDICINE*

BY W. H. PRICE, M.D., HEALTH OFFICER, DETROIT, MICHIGAN

IT IS CERTAINLY A SOURCE of satisfaction to me to meet with the dental profession of Michigan, and to acknowledge the support they have accorded the Detroit Board of Health in our activities for the benefit of the public health. There are few things of so great importance to the individual as his health. On it depends his whole attitude toward life and his relationship to his fellowmen. Generally speaking, those physically well are happy, prosperous and efficient; the sick and diseased are unsuccessful and inefficient. The health of the community is of importance to every individual, for upon it depends his own welfare and that of his family and that of his neighbors. The health of the community is of greater importance than commercial prosperity, for it is essential to commercial prosperity.

Without health there can be no real prosperity, and such material success as may obtain is of little benefit. We are all agreed that the children of the community are the potential capital of the community, and that on the subsequent efficiency of these citizens in embryo, the future efficiency of any body politic will depend. The necessity for universal education has been so apparent that the State has freely granted the right of compulsory education. And yet so many physical defects interfere with the pupil obtaining the full benefit of the advantages offered by education, that it seems it would be of the greatest advantage to the State to supplement compulsory education with a proper supervision over the physical welfare of the children; and this in order that they may attain maturity with their ultimate efficiency in no way impaired by defects that are easily correctible or preventable. And the necessity of doing this is further emphasized when we realize that by so doing we would greatly reduce the number of defectives and dependents now present in our midst. We are greatly indebted to the support accorded us by the local Dental Society. We started the dental clinics in Detroit, with the aid of the Dental Society, and I can say that it is easier to obtain funds to support these clinics than any other appropriation which we receive. I believe that this is due entirely to the preparation of the ground that has been carried on by the Dental Society. The oral hygiene division of the Board of Health is one of the most important of any of the divisions that we have, and I can say this the more vigorously because personally I have contributed practically nothing to that branch of the work. The oral hygiene division has been in the hands of the President of our Board, and he has given it a great amount of thought and time and attention. The efficiency that he has brought to the work has accomplished double what might have been expected from the appropriation that he has received, and I believe that he is on a very sure way of more than doubling the appropriation for the coming year that he has received in the past. I can absolutely promise that he will return 100% efficiency with the funds so appropriated, and 100% of profit to Detroit people.

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*An address before the Michigan State Dental Society, 1914.

EDITORIAL

The Thomas W. Evans Museum and Dental Institute

When the announcement was made several years ago that Dr. Thomas W. Evans, philanthropist and dentist, who died in Paris in 1897, had left a large bequest to establish a dental institute and museum, members of the dental profession wondered whether the institute would ever become a reality. Today we can say that it has and that the new building is located on the corner of Fortieth and Spruce streets, Philadelphia, Pa., on the site of the old Evans homestead, where Thos. W. Evans was born and spent the early years of his life.

By concurrent action of the trustees of the Thomas W. Evans Museum and Institute Society and the University of Pennsylvania, an agreement between them was executed in June, 1912, and ground was broken for the building in September, 1912. The cornerstone was laid on May 3, 1913, and the building completed was dedicated on February 22, 1915.

It is a magnificent structure built in the Tudor style of architecture, which prevailed in the time of Henry VIII., and is constructed of Indiana limestone and hard burnt brick. The building has a frontage on Spruce street of 242 feet and a depth along Fortieth street of 161 feet. It is built in the form of a letter H, and has three stories over a high basement.

The following description of the arrangement will give our readers something of an idea of the institution:

> The tower, which is at the main entrance at the center of the Spruce street wing, is 38 feet square, rising to 84 feet. In the center of the tower, beginning at the second story and reaching almost to the top of the third floor, is a large window, which lights the library on the second floor.
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> The Evans Museum occupies the east half of the Spruce street wing, and is as nearly fire- and burglar-proof as modern science can make it. This houses the priceless Evans collection.
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> In the west end of the Spruce street wing are the offices of the Dean of the Institution, and the Board room. The rest of the ground floor is divided into class rooms and laboratories, the entire north wing being devoted to this purpose. To the right and left of the monumental hallway, which extends from the roof to the first floor, are rooms for various phases of clinical dental service, radiography, photography, instructors' rooms, etc., and a model dental office.
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> Another of the imposing features of the building is the large operative clinic hall in the north wing on the second floor. This occupies the entire wing on Irving street, and is 200 feet long by 48 feet wide.
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> This clinic room is 30 feet high, with a glass wall on the north side; the roof for a distance of about ten feet is also glass, giving all the daylight possible. The floor is covered with battleship linoleum. A gallery on the south side contains the lockers. The room is furnished with 135 chairs, each chair equipped with electric service for power and light. There is also gas, compressed air and water service to each chair.
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> In the south wing, on the second floor, is the library, which extends up through the third floor, with galleries on each side. From the library, on the east end, extends the main lecture hall, 87 by 43 feet, and on the west end are two smaller lecture rooms. One of the principal objects of the institute will be the encouragement of research work, and a number of rooms for that purpose are on the second floor.

The main stairway ends at the second floor, in a large hall open to the roof. The side walls of this hallway are in pinkish gray stone, and the ceiling is of metal and plaster, formed and painted to represent the carved wooden ceilings of the Tudor period.

Large laboratories, with lighting similar to that in the clinic, occupy the south wing on the third floor, and other rooms for research work and post-graduate instruction in the western end.

In the basement are locker rooms for the students, laboratories for mechanical dentistry, the metallurgical laboratories, and laboratories and lecture rooms for first-year men, and a restaurant for students and faculty. The power house adjoins the building on the north. This contains two boilers with a capacity of 400-horse power. The engines and electric generators are capable of producing 240 kilowatts, and will furnish power for the lighting and heating, as well as for the laboratories and the chairs in the clinic.

The dedication of the Evans Dental Institute School of Dentistry, University of Pennsylvania, on Monday, February 22, marked an epoch in the history of dental education. It not only formally opened the largest and best equipped plant in the world, devoted exclusively to the teaching of dental science, but above all it demonstrates the wisdom of modern educators in their endeavor to strengthen the worthy schools already established rather than to found new ones, which so often have a hard struggle for existence, and which, because of the lack of necessary funds, sometimes produce inferior work. The standard which the Evans Institute will be able to maintain will be of the very highest type, and will result in carrying out, in the most effective manner possible, the wishes of the great Philadelphia philanthropist, by whose name the Institute and School will hereafter be known.

The benefaction of Dr. Evans includes this building with its equipment and a substantial endowment fund. The dedication of this, the largest and best equipped institution devoted exclusively to the teaching of dental science, included addresses by Hon. John Weaver, president of the Institute; Mr. John Howard Mummery, M.R.C.S., L.D.S., London, England; Dr. William Simon, of Baltimore College of Dental Surgery, and Dr. Edward C. Kirk, Dean of the Thos. W. Evans Museum and Dental Institute School of Dentistry. Mr. John T. Windrim, the architect of the building, then formally presented the key of the building to Mr. Weaver, who accepted it on behalf of the Thomas W. Evans Museum and Institute Society. The meeting was then turned over to Dr. Edgar F. Smith, who, after an introductory address on behalf of the University of Pennsylvania, conferred honorary degrees upon nine or ten men who have distinguished themselves in their respective professions. The exercises closed with the singing of "Hail Pennsylvania."

On Tuesday, February 23d, the new building, the Evans museum and laboratories were open for inspection and a large number of clinics was given throughout the day by prominent dentists. One of the splendid features of the Institution is that any member of the dental profession who desires to do any special research or other work will be privileged to do so.

A Matter of Credit

From time to time we have noticed DENTAL SUMMARY articles appearing in other dental journals without a line of credit to our journal, but have made little mention of it for we do not want to be eternally "kicking". The "last straw," however, was the appearance of one of our editorials, "Inspection of Dental Offices by the State Board of Health," in the *Dental Register*, December, 1914, with credit given to *The Western Dental Journal.*

This editorial first appeared in THE DENTAL SUMMARY, July, 1914, page 758. It was republished in *The Western Dental Journal*, Nov., 1914, without credit, and *The Register* taking it from *The Western Dental Journal* gave that magazine credit for the editorial as original with them.

Of course, we don't care anything about the matter ourselves, but write this to relieve Editor Allen of *The Western Journal* of the chagrin of having to father the article.

In the future if Charles Channing will be a little more careful about giving due credit he will escape such calamities.

Of course Editor Hoff gave credit, even though to some one else, but he might have given the matter to his readers several months earlier by taking it direct from THE DENTAL SUMMARY.

OBITUARY

IN MEMORY OF DR. BUTLER

BY H. L. AMBLER, M.D., D.D.S., CLEVELAND, OHIO

DOCTOR CHARLES R. BUTLER was of Hugenot ancestry; his grandfather, David Butler, moved with his family from Bradford, Conn. to Atwater, Ohio. His son, Rufus Butler, married Mary Russell of the above place. She was a descendant of Lord Russell; her father and the paternal grandfather of Dr. Butler were soldiers in the American army during the Revolutionary war.

Rufus and Mary Butler had ten children, one of whom was Charles Richard who worked on his father's farm and attended public school. When nineteen, he began the study of medicine. He located in Cleveland, Ohio, in 1854 and studied dentistry with M. L. Wright and W. H. Atkinson, and surgery with Elisha Sterling. He was graduated from Pennsylvania College Dental Surgery 1858, and from Cleveland Medical College—now Medical Department Western Reserve University— in 1865.

He was the first Professor of Clinical Operative Dentistry in the country; he held this chair in the New York Dental School in 1864, and in the Ohio College Surgery in 1867. In the latter he also taught Steel Technics, and long before the close of his remarkable career, attained an international reputation.

Dean of the Dental Department Western Reserve University, 1892, Ex-president American Dental Association, Ohio State Dental Society, Northern Ohio Dental Association and Cleveland City Dental Society; Member Odontological Society, N. Y. City 1872, Illinois State Dental Society and Delta Sigma Delta; honorary member of Cleveland City Dental Society, life member National Dental Association.

Activities of Dr. C. R. Butler in the Ohio State Dental Society: Offices and committees charter member 1866 and of re-organized society 1884; second vice-president 1868; corresponding secretary, 1869, 1871, 1872, 1873; president, 1875; board of examiners, 1874 to 1891; board of directors, 1886 to 1899, 1898 to 1912; committee on constitution, 1866, 1900, 1901; committee on dental law, 1887, 1888; executive committee, 1866, 1868, 1876, 1884; ethics committee, 1879; membership committee, 1886, 1894, 1895; history committee, 1900 to 1913; arrangements committee, 1889; committee on district societies, 1888.

ELECTED LIFE MEMBER, 1910

Papers and clinics: "Discipline Head, Heart and Hand" 1870; "Dental Law" 1887, 1888; "Concentrated or Associated Effort" 1875; "Anesthetics" 1876; "Rapid Excavators" 1880; "Treatment and Filling of Approximal Cavities," 1881; "Impacted Third Molars," 1885; "What Should be the Treatment in Cases of Impacted Third Molars?" *Items of Interest,* 1886; Clinic, 1871 (no title); Clinic, "Rapid Excavators," 1880; Clinic "Gold Lined Tin Filling," 1899; "Failures," 1889; "Combination Fillings," 1890; "Septicemia," 1891.

He was a faithful member whom everybody loved as a father and admired for his personal attainments. In 1857 when he went to dental college he took pluggers and excavators of his own manufacture and a mallet with an ivory head and ebony handle and he was called "The Hammer and Punchman," because he used the mallet for condensing gold foil. In 1860 he made a mallet of a cylinder of laurel root filled with lead and tin melted together, and the handle was of live-oak taken from the battleship Kearsarge when she was dismantled after the civil war. Before the dental engine (1868) was used he made a set of burs for cutting down gold fillings, and they were called "Plug Finishing Burs." In

1868 he made a set of fifteen hand mallet pluggers, and in 1878 another set of eight; in 1881 a set of six rapid excavators; in 1896 a set of five chisels, called "Improved Proximal Enamel Cutters"; in 1868 to 1869 burs and drills for the dental engine; in 1906 special instruments for repairing cavities for filling.

Duplicates of the above instruments have been furnished to the profession by The S. S. White Co., the only manufacturer that Dr. Butler ever supplied with models. The pluggers, chisels and mallet referred to in the *American System of Dentistry* in the chapter by Dr. Louis Jack. The instruments are still on the market, and they have been copied by different manufacturers, possibly in some cases with slight variations, and the name has been changed; they were also made as cone-socket pluggers and excavators.

He wrote various articles for the dental journals, among them were several on "The Working of Steel;" he brought deathless beauty out of steel and also gold. He was a lover of the microscope and did considerable histological work, and mounted numerous specimens.

Some wise philosopher has said, "Man should have a hobby," and we are willing to admit the wisdom of it, as a diversion. The study of precious gems was his "hobby" and "gemology" was not altogether a theory with him. He was an expert in precious stones and very often produced novel artistic designs in which he mounted them.

March eleventh, 1909, at the Hollenden, in Cleveland, a complimentary banquet, which was attended by a large number of home and outside dentists, was tendered him as a fitting reminder of his fifty-four years of honorable dental practice. The occasion was one long to be remembered as the like of it never has occurred in Cleveland, and it always remained a "bright, particular spot" in the doctor's memory.

He enlisted in Company H. 150 Ohio Volunteer Infantry, 1864, under Col. Hayward; he was promised a position as second assistant to the Surgeon Major, but on arrival at Washington he was placed in the ranks, and he served in the army of the Potomac under General Buell, in Forts Bunker Hill, Lincoln and another fort near Georgetown. Then he was called from the ranks to be second assistant to Surgeon Major Smith of Ohio, in which position he remained until the close of the war, when he was honorably discharged.

He was a most intimate friend of W. H. Atkinson and Corydon Palmer, two of the greatest men dentistry ever has produced; he had as a student Royal W. Varney, one of the finest operators of his day.

In his enthusiasm for his chosen profession, he put forth his best and most persistent endeavor to master everything in connection with it. Nearly every dentist who has made his name immortal has been a teacher; their lives have been written, their merits described, their achievements recorded and their virtues extolled, thus has it been with our most highly esteemed and life-long friend, the memory of whom we shall ever cherish.

His faculties were trained in accordance with their native tendency. He kept his own individuality and developed into the best manhood; he always stood for the highest,noblest, purest in every walk of life, never a seeker and toiler for riches, but considered duty more than dollars, character better than position; he decided to do something for this world, and he went at it with a steady purpose which never flagged; he endeavored with wisdom and courage to see clearly and guide rightly those who sought his counsel; he embraced the principle of Divine love and sought to obey the duties which this love reveals. He was a 33° Mason and a member of the Mystic Shrine and has held various offices in the different branches of Masonry, being one of the most active and honored representatives of the craft.

Dr. Butler often said, "The ideal condition is when a man's mind strays back to his work and he enjoys it." He opened the windows of his mind and aimed at lofty ideals; comparison, reason and judgment were well developed, "good, better, best," was always before him both morally and professionally. He went abroad several times and in 1881 was an attendant member at the International Medical Congress in London; member of the Advisory Council of the World's Columbian Exposition on Dentistry, Chicago 1892; attended Memorial Celebration in 1894 of the fiftieth Anniversary of the discovery of Anesthesia, by Horace Wells, a dentist.

In his mind there was a blending of those attributes which produce the ideal dentist, perception enabling him to formulate wise conclusions, leading to reasonable actions. He believed in training the faculties to practice what is good and true, and acting in a becoming manner, thinking that "All affectation but creates disgust." He was a model of all that is orderly and prompt; he was a kind, loving husband, and his grandchildren "doted" on him. Let us cherish the memory of his beautiful life and trust it may find many imitators.

He was president of the Board of Trustees of the First Methodist Episcopal Church of which he was a life-long member, his labors and influence being a potent factor in the growth of the church. The Rev. Frank W. Luce, the doctor's former pastor, paid a truthful and glowing tribute to the precious memory of the departed, at the funeral; otherwise the Oriental Commandery conducted their beautiful and impressive funeral services, bidding farewell to the dear Sir Knight. The remains were interred in Lake View Cemetery in a lot which he had chosen and upon which he had erected a modest granite monument.

One of his favorite mottoes was: "To live in the hearts of those we love is not to have died." Six of his intimate professional friends acted as honorary pallbearers. He is survived by a widow, Mrs. Jane Eddy Butler, who has moved to St. Paul, Minnesota.

Dr. N. E. Hooper

Newton Erastus Hooper was born in Chautauqua County, New York, July 6, 1854, and moved to Michigan with his parents in 1858. His parents were poor and as soon as he became old enough to work he was obliged to contribute to their support. He educated himself by his own efforts and after many hardships was able to open an office in the village of Decatur, Michigan, in 1875, where he practiced dentistry almost constantly until his last illness.

He was taken with pleurisy on the 23d of last December. This left him after a few days, but brought on serious trouble with his heart, which resulted in his death on the morning of January 6, 1915. His family consisted of his wife and two children, a boy and a girl.

He was very successful in his profession and always very honest and conscientious in his work. Although he was in business for very nearly forty years and was one of the oldest practicing dentists in the state, he always strove to keep abreast of the times and was quick to see and adopt new and improved methods.

He was at one time president of the Southwestern Michigan Dental Association, and had a host of friends and acquaintances throughout this part of the state. He was loved and respected by his fellow-townsmen and his loss was deeply mourned.

During the last four years he has been associated in business with Dr. R. J. Huyck, formerly of Chicago, who will now conduct the office alone.

Dr. Alfred E. Griffin

Alfred E. Griffin was born at Hunter, Greene county, New York, December 4, 1831, and died at Bellefontaine, Ohio, January 26, 1915, aged 84. He was reared on a farm in northern Ohio. At 20 years he went to Oberlin College and afterward taught school, and took up the study and practice of dentistry. An accident to one of his ankles, which made it impossible for him to stand for long periods, caused him to give up dentistry for a while, and in the meantime he taught school.

On October 3, 1861, he married Clarissa Reed, of Greenwich, Ohio. Dr. Griffin enlisted in the army at DeGraff and his wife returned to Greenwich.

Following his service in the army he located for a short time at Marion, Ohio, and then came to Bellefontaine in April, 1864, and this city has since been his home.

Bellefontaine profited through Dr. Griffin's residence. He served the city many years as a member of council and school board. He was also for many years a member of the board of trustees of the city water works plant and no public work was undertaken here that he was not in some way connected with it. He probably served his home city more and better than any other man who ever lived in it.

He was a forward-looking man and the prestige this city enjoys above its neighbors today may in large measure be attributed to Dr. Griffin. Every movement for the right had his support and having high ideals he was ever an advocate of the nobler things of life.

He was the father of the Municipal Ownership idea in Bellefontaine, having taken active part in the building of the gas plant, water works and the first electric light plant. He always believed that the municipal ownership of public utilities, with proper administration, is the ideal for any city, and to him, perhaps more than to any other citizen, is due the fact that Bellefontaine retains the franchise for furnishing each of these commodities.

Dr. S. M. Cummins

Dr. Stephens Marion Cummins, who had been in active dental practice in Elkhart, Ind., for over fifty two years, died February 7, 1915, following an operation for obstruction of the bowels. Dr. Cummins was born in Eldertown, Pa., August 22, 1839. He entered the office of a local dentist in 1856, there acquiring the rudiments of his professional education.

He practiced a short time in Dayton, Ohio, from whence he moved to Bluffton, Indiana, in 1859, remaining there and in Warsaw, Indiana, a short time he located in Elkhart in 1862. Later on, about 1870, he received the degree of D.D.S. from a dental college in Cincinnati. During his long period of dental practice he became widely known and enjoyed a very extensive and lucrative practice and died possessed of considerable wealth.

During all his life Dr. Cummins was closely identified with the business, political, and social life of the city, with which he literally grew up. Although the Doctor never sought political honors for himself he was elected Mayor of the city in 1885.

Dr. Cummins was a communicant of the Episcopal church, a member of the Elks and Masonic Lodges, and Elkhart Commandery Knights Templar, and the City and State dental societies.

While in Bluffton Dr. Cummins married Miss Helen M. Case, April 15, 1861. Surviving Dr. Cummins are his wife, their two daughters, Mrs. V. W. Van Fleet, of South Bend, Ind., and Mrs. R. C. Barney of Elkhart. Three brothers, Dr. W. G. Cummins, of Chicago, Dr. D. E. Cummins of South Bend, Ind. and Dr. R. B. Cummins of Blairsville, Pa. and a sister Mrs. Chas. Coleman, of Erie, Pa.

SOCIETY·ANNOUNCEMENTS

Examination of Dentists for the U. S. Army

The Surgeon General of the army announces that examinations for the appointment of Acting Dental Surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado, and Fort McDowell, California, on Monday, April 12, 1915.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 27 years of age, a graduate of a dental school legally authorized to confer the degree of D.D.S., and shall be of good moral character and habits.

Acting Dental Surgeons are employed under a three years' contract, at the rate of $150.00 per month. They are entitled to traveling allowances in obeying their first orders, in changing stations, and in returning to their homes at termination of service. They also have a privilege of purchasing certain supplies at the Army Commissary. After three years' service, if found qualified, they are promoted to the grade of dental surgeon with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There will be nine vacancies to be filled.

The Georgia State Dental Association

The forty-sixth annual meeting of the Georgia State Dental Association will be held in Atlanta, Ga., at the Piedmont Hotel, June 17th, 18th and 19th, 1915, beginning at 11:00 A.M., Thursday, June 17th. We have every assurance that this will be an interesting meeting.

Every ethical dentist in Georgia is respectfully invited to attend, and become a member of this organization. Also, a most cordial invitation is extended to members of other associations to meet with us.

For further information address M. M. FORBES, *Secretary*,
803-4 Candler Bldg., Atlanta, Ga.

Lake Erie Dental Association

May 20, 21, 22—just the time of year that tired feeling begins to steal over you. Why not attend the Lake Erie Dental Association, at Hotel Bartlett, Cambridge Springs, Pa.? Good papers and clinics and a delightful spot to spend the week's end.

J. F. SMITH, *Secy.*

The Kansas State

The Kansas State Dental Association will hold its next annual meeting at Topeka, April 27th, 28th and 29th.

A. L. BENTON, *Secy.*

The South Carolina State Dental Association

The South Carolina Dental Association meeting has been changed from April 13–16 to April 27–30. The place is Columbia, South Carolina, Jefferson Hotel, the reason of the change being out of courtesy to the Southern States Musical Festival.

Illinois State Dental Society

The 51st annual meeting of the Illinois State Dental Society will be held at Peoria, Ill., May 11, 12, 13, 14, 1915.

J. M. BARCUS, *Pres.*,
Carlinville, Ill.
HENRY L. WHIPPLE, *Secy.*,
Quincy, Ill.

Michigan State Dental Society

The Michigan State Dental Society will hold its annual meeting at Grand Rapids, April 15, 16, 17. The meeting will rank second to none ever held in the state. Hermann Prinz, D.D.S., M.D., Professor of Materia Medica, Philadelphia, Pa., will give an illustrative lecture on Local Anesthesia. Dr. A. S. Warthin, of the University of Michigan, Dr. J. H. Kellogg, of Battle Creek, and others have promised papers. One session will be devoted to progressive clinics, and one session to regular clinics. The manufacturers' exhibits will be many and complete.

Dr. Edwin J. Chamberlain, of Grand Rapids, will reserve space upon request, and Dr. O. W. White, Fine Arts Bldg., Detroit, will mail programs to non-members upon request.

F. WARD HOWLETT, *Secy.*,
Jackson, Mich.

The Susquehanna Dental Association of Pennsylvania

The 52d annual meeting of the Susquehanna Dental Association will be held at Irem Temple, Wilkes-Barre, Pa., May 18th, 19th and 20th, 1915.

GEO. C. KNOX, D.D.S., *Rec. Secy.*

The Louisiana State Dental Society

The 37th annual meeting of the Lousiana State Dental Society will be held in New Orleans, June 3, 4, 5, 1915, at the Grunewald Hotel.

DR. P. W. TROWBRIDGE, *Secy.*

Ohio Valley Dental Society

The Ohio Valley Dental Society (component of Ohio State Dental Society), will hold a semi-annual meeting at Athens, Ohio, on April 14, afternoon and evening. A cordial invitation is extended to you to be with us. There will be a banquet at our celebrated Hotel Berry in the evening, and Dr. L. E. Custer, of Dayton, Dr. Edward C. Mills, of Columbus, and Dr. Charlie W. Mills, of Chillicothe, will be on the program.

J. S. BASOM, *Pres.*
W. S. MURRAY, *Secy.*
Athens, Ohio

American Institute of Dental Teachers

At the last annual meeting of the American Institute of Dental Teachers held at Ann Arbor, Mich., the following officers were elected for the ensuing year: President, H. M. Semans, Columbus, O.; vice-president, S. W. Bowles, Washington, D. C.; secretary-treasurer, J. F. Biddle, 517 Arch street, N.S., Pittsburgh, Pa. Executive Board: A. W. Thornton, Montreal, Canada; R. W. Bunting, Ann Arbor, Mich.; A. D. Black, Chicago, Ill.

The next annual meeting will be held at Minneapolis, Minn., January 25, 26 and 27, 1916.

North Carolina State Board

The next regular meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at nine o'clock on Monday morning, June 21st. Full information and application blanks may be secured by addressing the secretary.

DR. F. L. HUNT, *Secy.*,
Asheville, N. C.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV APRIL, 1915 No. 4

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The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

Editorial Office: 195 16th Avenue, Columbus, Ohio
L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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Yearly Subscription, $1.00 in U. S. Canada $1.40.
Foreign, U. P. U. Countries, $1.75. Advertising Rates on Request

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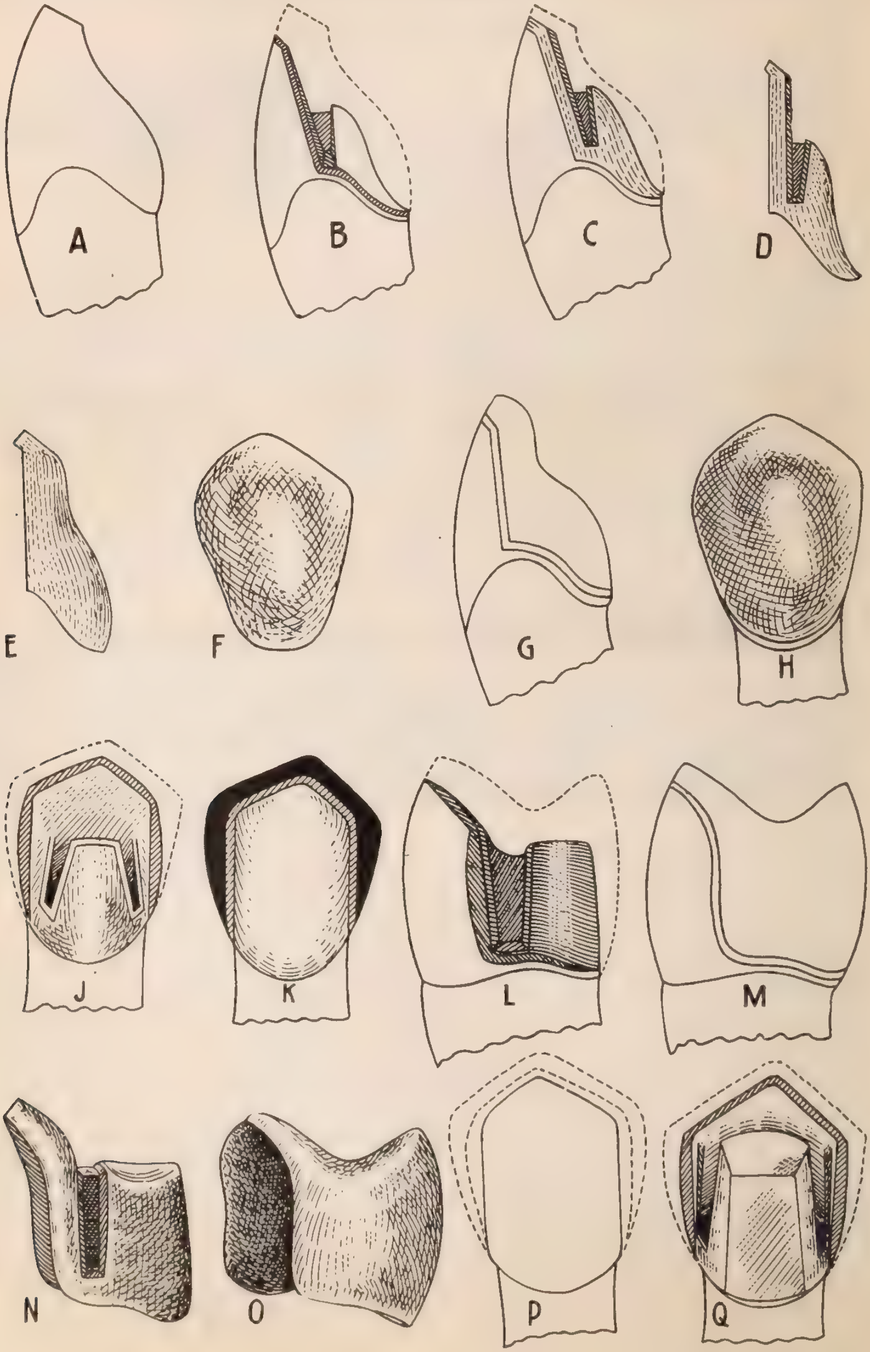
REGULAR CONTRIBUTIONS

A NEW REMOVABLE BRIDGE ATTACHMENT

BY E. BALLARD LODGE, D.D.S., CLEVELAND, OHIO

ONE OF THE MOST DIFFICULT PROBLEMS encountered in the field of dental prosthesis is found in mouths of patients who have lost the upper bicuspids and molars of one side, and in whose mouths there are present the corresponding teeth of the other side and the cuspids and lateral and central incisors. These natural teeth being of good quality and being firmly attached, the problem presented is how shall we restore the lost teeth and attain the highest degree of efficiency with artificial teeth? To make a restoration we should seldom if ever resort to a gold shell crown for carrying an attachment to retain a partial denture, if such shell crown is to be attached to an anterior tooth. Its unsightliness alone is sufficient reason for its rejection. This objection is perhaps less forceful in the case of the second bicuspid, but even with this tooth a natural enamel face is preferable to a gold crown.

If these teeth are employed as abutments for a removable bridge, there are objections against cutting down good natural crowns and destroying pulps, and in the light of recent developments in dental pathology it



J Lingual surface of cuspid showing position of grooves and preparation to receive the fixed gold casting.

L Represents prepared bicuspid tooth.

M Indicates N and O in position upon L.

N Shows casting to be cemented.

O Is the removable part.

P Represents the buccal outlines of enamel and the applied fixed and removable parts for the bicuspid abutment.

Q Shows method of cutting down a bicuspid, the grooves and restoration outline.

becomes a matter of greater importance than has heretofore been believed to avoid pulp removal and the necessity of root canal filling, insofar as such avoidance may be possible.

An alternative may be resorted to by which we have neither the loss of the natural crown nor the destruction of the pulp. The writer's method consists in cutting away the lingual and proximal enamel from A, as seen in B, with discs and stones, and the cutting of grooves after the order of Carmichael cavity preparation, to which a cast gold attachment is made, the latter, in turn, containing grooves for the reception of a removable part, E. Diagram C represents the cuspid A cut, as in B, and with its fixed gold part in position. E represents the removable part, proximal view. F shows the lingual view of the same. The removable part is cast of 22-karat gold, which is alloyed with 5% of platinum or platinum and iridium as now used in form of wire.

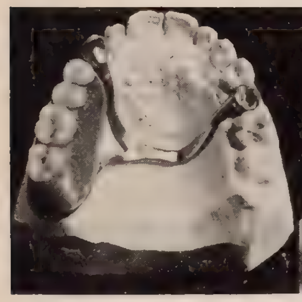


Fig. 1

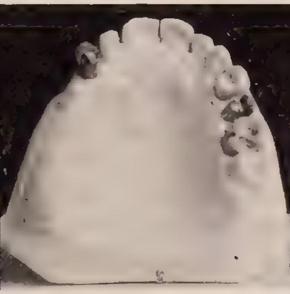


Fig. 2

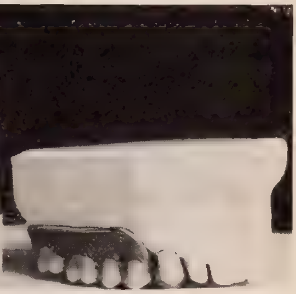


Fig. 3

In G we see the proximal outlines of the fixed and removable parts. In all cases it should be observed that the border of the removable part be a slight distance removed from the margin of the fixed portion of the abutment. This is probably obvious, since, to allow the removable part to exceed the border of the fixed gold attachment would tend to invite decay, because of the retention of the secretions under the margins of the removable part. This, of course, could not occur if it did not extend beyond the fixed gold portion. H represents the lingual aspect of the cuspid tooth with both gold parts in position. K represents the labial surface. The heavily shaded portion in this diagram represents the removable part, the intermediate portion the fixed gold part, and the light center represents the enamel. Again referring to the manner of cutting the lingual surface of the cuspid tooth J, the longitudinal grooves, if conditions permit, should be 50% deeper than is their distance apart, i.e., if the grooves are 4 millimeters apart it is well to have them 6 millimeters deep.

If we are to employ the upper right cuspid for an abutment then we may use the left second bicuspid for the balancing abutment, as seen in the reproduced photographs, Figs. 1 and 2.

The preparation of the bicuspid for the interlocking parts is identical with the preparation of the cuspid with the exception of the lingual cusp, which must be ground down and restored in the fixed and removable castings.

The longitudinal grooves are connected by a transverse groove. The axial walls of the longitudinal grooves should be parallel or only slightly converging from base to transverse groove. The base should be flat and all details of preparation should be according to the principles laid down by authorities on that subject, such as doctors Black, Conzett and others.

In the production of the castings the indirect method is preferred by the writer. Detroit modeling compound impressions are taken in specially prepared tube trays. Amalgam models are then made, the material being carefully and firmly packed. These models are then mounted in plaster of Paris pedestals. In making the wax patterns, Taggart's wax is greatly preferred by the writer, since its consistency when at room temperature admits of carving with a sharp lancet with less danger of breaking than other waxes in the writer's experience.

For the purpose of overcoming the contraction of the gold, No. 24 gauge platinum or iridio-platinum wire is used in the form of a staple, which is bent to conform to the axial walls of the parallel grooves and close to the floor of the transverse groove. The wax pattern is made in the usual way upon the amalgam model and the staple is heated and immediately pressed into the wax. The pattern is then invested and the casting is done by any method usual with the operator.

Some difficulty is likely to be encountered because of the inevitable slight contraction of the gold, which takes place in spite of efforts to combat it. A hot investment and a cross bar of threaded platinum wire may be used and still sufficient contraction may take place to make it difficult to remove the castings one from the other. To relieve this trouble it becomes expedient to leave a lug with square sides upon the lingual surface of the wax representing the removable part, so that it may be grasped by the flat-nosed pliers. The sprue wire reproduction is scarcely adequate as it should be placed at the tip of the cusp and it is scarcely in line with the line of draught. In case the castings fail to come apart readily, when assembled, it has been found that with a slight notch drilled into the center of the cavity surface sufficient to admit of the point of a small hoe excavator and with the flat-nosed pliers upon the lug of the other casting they may be readily separated. It goes without saying that before exercising much force in pressing them together, they should first be clean and smooth and should be lubricated. By frequent placing on and off the castings will become adapted to each other and will then be readily assembled and disengaged. This being accomplished the lug is removed.

Now the question may arise, are we to take pains to have the common axis of the longitudinal grooves of one fixed attachment parallel to the common axis of the longitudinal grooves of the other fixed part? The answer is no. On the contrary the attachments must diverge on the upper teeth, and if this kind of bridge is adopted for the lower teeth, the axis must converge just as in the bridge work advocated by doctor Knoche.

The connecting bar across the palate should be of iridio-platinum or of some metal of equal or greater rigidity and elasticity as tungsten.

Reliance, then, is had upon the elasticity of the connecting bar to enable the appliance to snap into place and to remain firm, thus affording close and positive retention to the bridge.

In all cases upon the upper teeth the connecting bar should be placed over the roof of the mouth well back from the rugæ, so as not to embarrass the tongue in its functions of speech or of crushing soft food.

The writer fully recognizes that this bridge, because of possible unequal pressure of the saddle, may fall to that degree, somewhat short of the ideal we hope for. In the nature of the case the distal end of the saddle has, of necessity, a greater latitude of motion than the anterior portion. This shortcoming, however, the writer believes will be adequately minimized by employing the method of doctor Peeso, viz.: by compression of the soft tissues in adapting the saddle. Like all good removable bridge work, this bridge is difficult to construct, but with the advent of the casting process this kind of work has become entirely feasible.

In conclusion I make the following claims for this bridge: *First*, it is sanitary, since it is removable and the abutments cannot retain substances prejudicial to the hard or soft tissues. *Second*, the pulp is not removed, thus largely avoiding the liability of pericemental trouble or apical abscess due to imperfect root canal operations. *Third*, it does not become necessary to remove the labial or buccal portion of the natural crown, with the exception of the slight portion of the proximal and incisal edges.

432 Rose Building.

SILICATE CEMENT RESTORATION*

BY I. H. HARRINGTON, LOUISVILLE, KENTUCKY

This clinic consists of a gold inlay restoring the incisal angle of the lateral incisor with the labial surface removed and the incisal edge and that portion that is required to make the contour filled with porcelain or silicate cement.

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*Clinic Kentucky State Dental Society 1914.

RELATION OF THE DENTIST TO THE RESULTS OF MOUTH INFECTIONS*

BY FREDERICK B. KREMER, D.D.S., MINNEAPOLIS, MINN.

IN VIEW OF THE PRESENT INTEREST of not only physicians and dentists, but of the public as well, in the relation of mouth infections to certain systemic diseases, it seems wise that we should give the matter more careful thought than it has received in the past. In order that we may do this intelligently it might be well to consider the facts as they appear to be at the present time.

Like all new ideas, this has been and is the subject of much misapprehension and especially as relates to the attitude of the medical and dental professions toward it.

It is of almost daily occurrence to have some layman visit us for the purpose of determining the relationship between his teeth and some particular disorder with which he may be afflicted. It is of almost equal frequency that some one of our good medical friends calls us to account for taking the position that every ill to which flesh is heir has a dental origin.

Within the week last past I have been brought to book by four physicians for this alleged heresy, and cautioned by them that "talking these things so freely with patients is likely to do much harm." These were all good friends of mine, and their remarks carried no rancor of a personal nature, so I purpose treating the matter kindly.

The very nature of the practice of medicine or any of its specialties fosters ultra-conservatism. The practitioner deals not only with pain and disease but carries responsibility for life itself, and if he hesitates to accept new doctrines, he has the best of reasons for it.

If all goes well, he is regarded as having done what he was paid for doing; if wrong, he is an ignorant ass, and should be sued for damages. We must therefore be patient with this type of intolerance, realizing that in time such things always adjust themselves. As to members of my own profession, I am obliged to say that with a very few exceptions they are of much the same mind as our medical brethren and equally lacking in faith. It is for the purpose of definitely stating my own position in the matter, and outlining what I believe to be a proper working basis between dentistry and medicine, that I present this paper.

The importance of the teeth and associate parts as causative factors in the production of diseases of other and remote organs, has been recognized for many years, but exact knowledge of the process by which this has been accomplished has not been well understood until recently.

*Read before the Minneapolis Dental Society.

It was presumed that the principal damage sustained was by reason of improper mastication of food, and by taking into the stomach the products of putrescence from unhealthy dental organs, thereby vitiating the digestive juices and interfering with the proper performance of their functions. These ideas are not without foundation in fact, but after all they are only half truths, and have led to useless controversy rather than scientific investigation.

Advanced thought appears to hold firmly to the bacteriologic doctrine of disease, and the culture media and the microscope are constantly revealing new and convincing proofs of the widespread influence of these unseen elements of destruction to human health and life. Diseases that were involved in deepest mystery are now well understood and successfully treated. When Jenner proposed fighting smallpox by inoculation it required a high degree of courage upon the part of the medical profession to accept his doctrine and practice his teaching. Today the majority of thinking people recognize its value, and the malady has been robbed of its terrors. Diphtheria has also yielded a large measure of its mastery over human life, since the introduction of antitoxin, and yet there are some in the ranks of medicine today who are like the country boy who, when he saw the camel, said: "There ain't no such animal." Even Sir Joseph Lister found himself skating on thin ice when he asked for so simple a thing as cleanliness.

In view of past history of this kind, which anyone may read, is it to be wondered at that some object so strenuously to the assertion that the mouth plays a far larger part in human welfare than our fathers in the profession realized or taught?

The future holds much in store for us in the way of added knowledge which can only come with study and investigation, but we already know enough to cause us to take cognizance of the relation between pathological conditions affecting two or more organs or functions in the same person. No one seriously disputes the influence of infected tonsils upon the heart and joints. Why? Because they are tonsils? Not at all. Simply because they are known to be favorable locations for the manufacture and distribution of those elements which affect joints and hearts unfavorably. No one would for a moment dispute the statement that these lethal elements are carried to heart and joints by way of the blood stream, and yet many of these same individuals hold up their hands and cry "heresy" when we assert that the same elements are generated at the root ends of teeth and are carried in the same manner to the same parts.

Furthermore, it is denied that the teeth are nearly so common a cause of infection as the tonsils by those who admit the possibility of both being involved. Here again it might be wise to consider the facts.

Prior to the introduction of the radiograph in dental surgery, we had no means of knowing root end conditions except as evidenced by swelling, soreness or loosening of teeth. We knew that we had two general types of abscesses affecting the teeth. The ordinary type with fistulous opening and the other type which we call "blind abscess" because it has no outward visible opening. These latter are extremely difficult of diagnosis except in acute stages when their presence is suspected by reason of pain or tenderness in the tooth upon pressure. By the aid of radiographic plates and films we can now make a diagnosis with accuracy in the majority of cases.

An examination of 269 radiographs of filled roots shows 211 defined abscesses, 55 cases of bone infiltration, and but three that were apparently free from pathological conditions.

From the advance pages of an article by Dr. Henry Ulrich upon this subject, I am permitted to quote that of 1,000 teeth examined by him seventy-one per cent. showed well-defined abscesses. Of the 269 cases referred to, there were 47 roots that were well and thoroughly filled, and 219 that were indifferently or badly done. It is of interest that the three cases that showed no pathology presented some of the worst examples of root filling that I ever examined. In the past six months we have made cultures from sixty cases of blind abscess and except in one instance we have developed streptococcic growths.

In the face of the foregoing facts, I think it perfectly safe to assert that teeth are a far more prolific source of infection than tonsils, as relates to adults. In routine examinations it is my custom to examine the tonsils, and while I find many cases that have to be referred to the throat specialist they are few and far between compared to teeth, as foci of infection. This statement does not obtain in the case of children who seem to be more prone to tonsillar infection than adults, and who are as much if not more frequently afflicted with cardiac infections than are their elders.

My investigations have not as yet carried me far enough to determine the part that abscesses of the deciduous teeth play, nor to prove the proportion of cases of this kind emanating from septic deciduous teeth and the tonsils. I merely call your attention to it because it offers a wide field for investigation, and one which may be fraught with great possibilities to mankind.

Referring again to the condition of the roots of teeth as shown by radiographs, I am led to lay special emphasis for the necessity upon the part of my own profession, for more intimate knowledge of the consequences of devitalization of pulps, and the filling of root canals, and to urge them to take this matter up and study it from this new angle of vision, and satisfy themselves as to their right to do this operation in the face of the facts which they are sure to find. Show me the surgeon, if you can, who would for one moment consider performing any operation where the tabulated results show such an appalling percentage of failures, and I will show you a man who would be read out of his profession as soon as the facts became known to his fellow practitioners.

This is a showing that ought to deter every thinking man from practicing pulp devitalization and root filling except it be under the most favorable circumstances and conditions, and then only with the full knowledge and consent of the patient who had been advised of the possibilities that may later confront him.

Granting for the sake of argument that these statements are susceptible of proof, the question at once arises—where do we as a profession stand upon the subject? We have already been accused of asserting that practically all of man's ills are traceable to his teeth, but this accusation is not based upon full knowledge of the facts.

We simply say that the teeth are such common sources of septic poisoning that they should always be considered in routine examination by surgeons and internists, along with the tonsils, stomach, the colon, the prostate and the kidneys. The alarming increase of septic diseases, many of which call for surgical interference of the gravest character, has kept pace with the growth of modern dentistry. Whether this has been mere coincidence, or whether there is a relation between these facts, is a thought that I wish to leave with you, as I believe it merits your careful and earnest attention. In my own mind, the matter has passed beyond the speculative stage, and appears to be well settled.

Let us examine the evidence presented, and see where it leaves us at the present time. It would be needless to argue in this day and age, the possibility of septic poisoning. This is so well established that we may safely use as our first posit, that any septic wound, sore or ulcerating surface, contaminates the blood stream, and this in proportion to the extent to which the exudates may be confined or prevented from draining away from the absorbents or the open mouths of blood vessels. The first effort of good surgery, once pus is known to exist, is toward the establishment of free drainage. If this cannot be accomplished in whole or in part, dependence for the patient's safety must be placed upon what is commonly spoken of as his resistance, or in other words, his physiological ability to manufacture antibodies fast enough to destroy the toxins as they are absorbed. The end result is dependent upon several things; the quantity and quality of the toxins, and the activity of the vital processes. As relates to our special field of surgery, we are not often called upon to consider quantity, as is the general surgeon. We have to do rather with the quality, and long continued and persistent activity. Two general types and conditions engage our thoughts as dental surgeons:

The open ulcerative surface as typified in that condition known as pyorrhea, and the other and deeper lesion known as alveolar dental abscess. If our understanding of general principles is not grossly at fault, we believe that the ills attributed to pyorrhea have been greatly overestimated. Of course we admit the possibility of absorption to a limited extent, and in cases of low resistance this might be, and often is, sufficient to produce toxemias of much gravity, but it is the blind abscesses to which we must look for the causation of by far the larger number of serious infections, especially of the heart and joints, for which the streptococcus appears to have a special fondness. The blind abscess discharges its products directly into the large Haversian canals which are so abundant in the jaws, or else into the maxillary sinus, infecting not only that cavity, but often the auxiliary sinuses of the nose and cranium as well.

While we have known that the blind abscess existed, and is often the seat of trouble, its full significance as an etiological factor in many other diseases was not impressed upon us fully until August of this year, at which time Dr. Henry Ulrich read his admirable paper upon this subject at Duluth, announcing that the blind abscess was not primarily a dental disease, but was of hematogenous origin, and therefore a secondary lesion.

Granting the truth of his position, it becomes apparent that our surgery in pulp removal and root filling has nothing to do with its causation, except to create an area of lowered resistance, thereby encouraging colonization of bacteria already afloat in the blood stream. This position has been vigorously assailed, but thus far the arguments adduced in opposition have lacked the element of scientific accuracy, and are therefore valueless.

As to just what part in this scheme that condition known as pyorrhea plays, is still a matter for speculation. Is it responsible for the loading of the blood stream with pathogenic germs, or is pyorrhea also a secondary condition? Is it merely a manifestation of the presence in the circulatory system of these bacteriologic elements? Will science show us at some future day that this condition is merely a barometer by which we can determine the presence and degree of activity of these germs? This is merely a suggestion which may possibly merit investigation.

We are now brought to a consideration of our relation to these conditions. Nothing in the dental curriculum as taught in the colleges at the present time, tends to qualify us to do work which is peculiarly in the field of the internist or the general surgeon. As dentists, we have neither the training nor the practice which would render us skillful in making a general physical examination, neither are we any better qualified, after the diagnosis has been made, to administer the necessary treatment, be it vaccine or salycilates.

The skilled and capable internist is just as necessary to the proper practice of our specialty as he is to the general surgeon. To him we must look for such general medical treatment as the case demands, placing at his disposal our special knowledge of dental pathology, in order that his efforts may be properly supplemented, and contenting ourselves with the surgery incident to the case, resting assured that in this field there lies all that any one man can accomplish, not only of glory to himself, but of service to mankind.

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DISCUSSION

S. Marx White, M.D.: Dr. Kremer does both the dental and the medical profession a distinct service by calling attention in his incisive way to these mouth infections as a cause for more generalized dissemination. The attitude of a profession is usually quite well gauged by its literature and, in the case of the medical profession, an examination of medical literature will show that medical men have long paid attention to the mouth as a possible source for systemic disease, the first great exponent of this idea being the great Hunter, of London, who called attention to the mouth as a probable source of infection in pernicious anemia, and within recent years and months much more accurate knowledge of mouth infections is reflected by a rapidly growing medical literature on the subject.

I am sorry that Dr. Kremer did not refer to this instead of to a few isolated and misrepresentative remarks by medical men. It is not a question of difference in opinion here between medical men and dentists because we are one in seeking accurate knowledge as to infective conditions wherever they may be found.

The recent tremendous increase in our knowledge of mouth infections is due to a new technic. This is so often the case in scientific work in all its branches, for a new technic often opens up a whole field of knowledge. The most important factor in this advance in knowledge of mouth infections is the radiographic examination, for the newer radiographic technic often shows us changes in the bone about the root ends which indicate a disease process, and in many instances the radiographic shadow can be said to be characteristic of root abscess. It is therefore the radiographer to whom we must turn for information, and our greatest thanks are due to the man, whether he be physician, dentist or even plain mechanic, who conceived the idea of using the small gelatin negatives which can be placed in the mouth to record a radiographic picture of three or four teeth with their roots at a time. Our knowledge in this field is still incomplete and while the information at hand shows conclusively that the root ends of devitalized teeth are frequently infected and that abscess seldom occurs except at the roots of devitalized teeth, we must not be too hasty or too sweeping in our conclusions.

Some things are not yet worked out, as, for instance, the truth of Dr. Kremer's suggestion that these infections are hematogenous or blood-borne in origin. Then, too, if they are blood-borne, we are forced to look further for a primary focus and are reminded again of the frequency with which dissemination occurs from local foci in the tonsils, nor must we forget the role which the gall bladder, the urinary bladder or other portions of the genito-urinary tract play, nor are we able as yet to get away from the possibility that the intestine in certain instances may be the site of local infection and the source of dissemination.

More work must be done upon the interpretation of radiographic plates of the teeth, for we do not know as yet the significance of the minor areas of absorption which are so often seen about tooth roots. We are gaining knowledge very rapidly concerning the mouth as a source of dissemination for infection. While doing this, we must neither be hasty nor inaccurate and I am simply urging caution as we proceed.

In the medical clinic at the University Hospital, a large amount of material is being collected and worked out with care. The oral work in these cases and the investigation of the bacteriology of the conditions is under the direction of Dr. Thomas Hartzell, and the co-operation between the medical and dental service is of the fullest and freest. We believe the information thus obtained is of decided interest and some of the work has already been published.

Dr. Kremer's work gives us information of tremendous value and we must pay strict attention to it. We must recognize that infective foci such as these dental abscesses, irrespective of whether they are primary or secondary, can be the source of infections, and when present must be eliminated. The means by which this is to be done we shall leave to our friends and workers of the dental profession.

J. W. BELL, M.D.: Oral sepsis, fortunately for both professions, is beginning to receive the careful consideration its importance demands. That diseased teeth and gums, in the form of root abscesses and pyorrhea, are frequent causes especially of chronic sepsis, can no longer be questioned.

The task before the medical and dental professions is to determine in a given case, whether the systemic manifestations are due to one or both of the diseased conditions described—root abscess or pyorrhea. It is apparent that this can be safely accomplished only by team work on the part of the members of the two professions.

To avoid error and fully protect the patient's interests will require great care, at least in the more obscure and doubtful cases. Both professions should, for the present, maintain a conservative attitude regarding the problem, and carefully investigate each case presenting evidence of chronic sepsis, with the view of eliminating other possible sources of infection, before removing suspicious teeth, even though the suspicion be based on a radiograph. Having decided, in a given case, that the systemic manifestations are due to abscessed teeth, what course shall we pursue? Evidently but one course is open—removal and drainage, aided by the use of the mixed autogenous vaccine in the more protracted and severe cases.

Justice demands that the physician carefully consider the condition of the teeth in all cases of possible chronic sepsis, and refer the patient to the dentist for further investigation, including radiographic examination. In the light of present findings, the radiograph should precede all new crown and bridge work.

In conclusion, permit me to say that we must not expect long standing tissue changes rapidly to disappear after removal of teeth, or treatment of pyorrhea.

W. H. MacNeil, D.M.D.: Dr. Kremer has given us a very good paper and one that is most timely. There are some points brought out that I can agree with most heartily and others that I think we as yet know too little about to accept his statements as true.

In the first place the public can hardly yet be expected to attribute bodily ills to diseased conditions of their teeth, especially when they are not giving them any concern in most instances. The extraction of the offending member usually closes the incident as far as they are concerned.

We must also take cognizance of the fact that it is but recently that Billings, Rosenow and their co-workers have advanced the theory of some systemic infections having their primary focus in the mouth.

We should be most guarded in using the word "cause" in relation to the focus of infection of a systemic disease. We should not with the evidence before us say that that focus is the absolute cause of a systemic disturbance. There are so many factors to be taken into consideration that it would be best to refer them to the family physician. As Doctor Kremer says, we must all get together. The oral surgeon has no right to diagnose a systemic condition of the patient and say that the mouth is related to it. Nor should the physician overstep his bounds and order teeth removed without consulting the oral surgeon.

I have personal knowledge of several cases of severe nervous breakdown, where the dentist in charge had pictured such dire results in these cases that it brought on illness requiring the patient to take to bed.

Rosenow and our own Doctor Ulrich state that systemic infection due to a focus of infection anywhere is probably of hematogenous or blood-borne origin. In the specific case of a devitalized tooth, where we are told that because of the lowered resistance, infection gains a foothold through the medium of the blood stream, can it be proven that the infection was not planted there at the time of that operation? Can Doctor Kremer or any one of us say that when this operation is done under aseptic conditions and done thoroughly that these teeth show foci of infection at their root ends? I thoroughly agree with Doctor Kremer that we must be conservative. But here's the rub. What are we to do with those cases where the destruction of the dental pulp cannot be avoided? Are we, with the evidence he has presented here tonight in view, going to advise the sacrifice of that tooth? I cannot agree with his viewpoint and should say that it is a most radical conclusion.

What we need most is to revise our methods and assure ourselves that we are doing this operation in a surgically clean manner. We are now reaping the results of our dirty, indifferent methods in the past, and I predict that where accurate data has been kept and the operation performed up to a high standard that the ratio will show us that as the laundries tell us, "It pays to keep clean."

Doctor Kremer has enumerated the two groups of chronic foci that we as dental surgeons are concerned with—the chronic alveolar abscess and the so-called pyorrhea pocket. Both conditions involve a single tissue—the peridental membrane. As a result of the involvement of this membrane, either at the apex of the root or at the gingivi, there is a suppurative destruction of the attachment of this tissue to the cementum covering the root of the tooth. As a result of this process the cementoblasts, the only cells that could cause reattachment of the tissue, are destroyed. Following this the peridental membrane and the bone disappear. In the case of the pyorrhea pocket, this detachment is permanent and pockets remain about the tooth and these are subject to further infection.

Up to date the only cure for an absolute case of pyorrhea that has advanced beyond a simple gingivitis, in my mind, is their removal. In the case of the dental alveolar abscess it may be amenable to therapeutic treatment, or in favorable cases the focus may be removed by resection of the denuded root end and removal of the granuloma or its extraction may be indicated.

In this advanced day of prevention and conservation we should expect much good from the mouth hygiene movement and from a more general and effective school inspection. The public, and more especially the coming generation, will understand and will demand protection for their children. Are we prepared for this added responsibility? We, better than anyone, can answer this. The most necessary thing that we, as dentists, need, is a more thorough education. When the association of dental faculties meets in January it is to be hoped that they will make some provision for a broader course in the education of our dental students.

Then we will be able to answer Dr. C. H. Mayo's much-quoted statement: "The next great step in preventive medicine must come from the dentist; are you ready to accept the responsibility?"

JAY N. PIKE, D.D.S.: As there seems to be some little doubt in the minds of some present as to the hematogenous origin of the streptococcus infection in the blind dental abscess, I would like to ask several questions. I believe that the answers that nearly every thinking dentist must give would do much to clear up this question. I believe that these answers would enable us as dentists, using the knowledge that we already possess as dentists, to arrive at the same conclusions in this matter that Doctor Ulrich has in an entirely different manner arrived at.

The questions are these:

1. Is it conceivable that a dentist, even using the worst asepsis, could always carry a streptococcus into the pulp canal of the tooth, even if we granted only 95% of blind dental abscesses as being streptococcus infections, could the dentist plant it that often possibly? Is it conceivable?

2. If we grant the above, how could we explain the presence of the streptococcus in the abscess in which the tooth has been devitalized as a result of traumatism, etc.? Surely no dentist planted that!

3. Where also did the infection gain a footing in the so-called blind cystic abscess on a vital tooth if not by the way of the blood stream?

4. Is it possible for anyone to remove a pulp from a tooth by any known method without producing a hemorrhage in the apical space?

5. If so, what is the technic?

6. Can there be a hemorrhage in any tissue without producing an area of lowered resistance in that tissue likely to become infected?

In whatever way we may answer the above questions there is one matter that relates vitally to our policy as dentists to which we should give serious and immediate attention.

We should ask ourselves whether in view of the tremendous percentage of abscesses occurring on the devitalized teeth are we justified in continuing the practice of devitalization? Isn't it better reasoning for us as dentists to discontinue the devitalization of teeth as a general practice until such time as these men who believe it a question of root canal technic can prove that such is the case, and until they can elaborate a method which can stand the fire test? Shall we continue what is certainly at the present time an indefensible practice at the expense of our patients' health and sometimes their life as well? Some arguments have been advanced that we who have been driven to believe in a rather radical extraction of devitalized teeth must prove our case. It would seem more reasonable in view of the preponderance of evidence on all sides that the advocates of devitalization should be compelled to prove their case first, unless perchance they feel what is properly a research problem should be worked out by the whole profession at the expense of the public.

In this connection I cannot refrain from adding what I feel is the great lesson we must draw from our consideration of this question. I believe it will drive us eventually to a higher and better dentistry and incidentally to a proper consideration of the prevention of the necessity for devitalization of teeth. We should at once discontinue all systems of bridge work or crown construction which necessitate the devitalization of sound healthy teeth. Above all, I believe we should turn to the care of the young child's mouth and instead of teaching our students to be only repairers of teeth, we should make them real dentists, capable of taking proper care of the mouth and also capable of co-operating with others in the care of the whole body, that we may better approach our ideal of a normal mouth performing a normal function in a normal body.

FRANK C. TODD, M.D : The essayist complains that, though no one disputes the influence of infected tonsils in the production of other infections, yet that the profession is slow to take up the same connection concerning teeth infections. For his comfort I would like to call his attention to the fact that the profession was just as slow to accept the idea of tonsil and sinus infection as causative factors in rheumatic, joint, heart and other lesions, as they seem to be now concerning teeth infections; indeed, much slower, for the former idea simply paved the way for the latter. It has been very difficult for the profession to grasp the idea that tonsils, however small and devoid of acute attacks, may be very detrimental to the general health, and serve as a source of infection. If they contain crypts laden with infected material, they are diseased and a menace to health, and too, the later complete removal of the tonsils as against incomplete removal was accepted grudgingly by a large portion of the profession, some of whom looked upon the complete operation as radical and others, having learned the old operation, finding the later operation more difficult, rebelled against its adoption.

The question is not as to whether teeth are more commonly the cause of general infection, but the essential point is that they are just as liable to be the primary focus as are the tonsils and sinuses, and too, we must bear in mind that in many cases no doubt there may be present several foci so that in order to effect a cure it may be necessary to attack more than one focus. Again, infected tonsils may keep up a pyorrhea and reinfect teeth that have been properly treated. Some years ago before we became so familiar with the relationship between mouth and other head infections, and secondary infections, we heard much concerning gastro intestinal autointoxication as a causative factor. Now we hear relatively little, and it is considered that such form of intoxication is of comparatively rare occurrence.

In connection with this question of teeth, tonsils and sinuses as causative factors in the production of infections elsewhere in the body, such as rheumatic arthritis and heart complications, I have been particularly interested in the study of secondary lesions occurring in the eye from these foci. These infections usually manifest themselves somewhere in the uveal tract which includes the iris, cilliary body and choroid. When the iris alone is involved the disease is termed iritis, but now more often the term uveitis is used, signifying an involvement of the entire uveal tract. Nowhere else in the body do we have as good an opportunity to make observation as in the eye. Here the inflammation is evident and may be readily observed so that the effect of any treatment applied to the sinuses, tonsils or teeth may be quickly noted.

Formerly all such so-called idiopathic infections not caused by syphilis, tuberculosis or gonorrhea, were considered of rheumatic origin. Fully 50% of the cases of uveitis or iritis belonging to this class called rheumatic cases, were especially intractible and often led ultimately to poor vision and sometimes blindness. They are especially apt to recur. We now are finding that such "rheumatic" cases often yield promptly and permanently to the removal of a septic focus situated particularly in the head, and I have had in my experience a number of cases that were rather definite, in which sinuses, tonsils or teeth were evidently the causative factors.

During the past few months at the university clinic or in private practice we have had eight cases in which Doctor Hartzell has found pockets of pus in the teeth, with the infection of streptococcus viridans. In all but two of these cases relief has apparently followed the removal of the teeth. The other two cases are recent, and curative results have not yet occurred though improvement is apparent. In none of these cases was there any other evident cause, and in six of these cases the Wasserman was negative. In the other two, Wasserman tests were not made. In one of the cases tonsils were also removed at the time the teeth were taken care of.

In addition to these cases I have a number of cases dating back over the past ten years, in which the clinical evidence seemed to demonstrate that the teeth were the causative factor, by the fact that complete relief followed only upon the eradication of the tooth infection, and in one interesting case the relief that followed was prompt upon the draining of a pus cavity at the root of a tooth, but in which there has recently been a recurrence co-incident with a return of the tooth symptoms and abscess. The tooth has now been removed by Doctor Maves and the eye is rapidly clearing up.

The following report is that of a case that consulted me in 1906:

A man, aged 62, acquired an acute uveitis, and for a long period of time was under the care of prominent and competent ophthalmic surgeons and underwent all forms of examination, with complete elimination of the possibility of syphilis, rheumatism or gonorrhea having any relationship to his ocular disease. In spite of all treatments, including salicylates, mercurials, mixed treatment, dieting, etc., the disease became chronic, with the development of firm iritic adhesions. His teeth had many times been examined, with apparently negative results, when a small abscess at the root of a tooth was discovered. On opening this abscess a fistulous tract extending to the tooth was discovered. This was freely opened, the cavity curetted and drained, and permanent relief speedily followed.

In another case in which syphilis was present (as shown by the history and a positive Wasserman) severe iritis repeatedly developed and in spite of treatment, recurred often. This patient had marked nephritis with a large quantity of albumen in the urine, and was under the treatment of a competent syphilologist who, because of the kidney trouble, could not use Salvarsan. After the relief of pyorrhea the iritis cleared up and has not recurred during the past nine months. This patient has, however, active syphilitic lesions in the throat at this time.

It is interesting to note that it has been an accepted fact in ophthalmology for over one hundred years that there existed a relationship between dental troubles and eye inflammations, though, of course, the character of the relationship was not well known. Over thirty years ago Nettleship recorded a case history of a patient with exudative choroiditis and punctate keratitis (a condition we now know to be of septic origin) where an aching tooth was thought to have a positive influence.

In closing, let me thank the society for this opportunity to discuss this very timely subject which Doctor Kremer has so well presented. The satisfaction that is resulting in the treatment of remote infections and to ophthalmologists in the treatment of these formerly very trying and serious diseases in the eye, is such that it is well worth our while to get all the light we can upon it. We no longer are obliged to resort to the rather indefinite and unsatisfactory term "rheumatic condition," but may usually definitely find the focus and eliminate it, relieving the patient and frequently preventing blindness that otherwise might occur.

HENRY L. ULRICH, M.D.: I hardly think I can add anything more to this get-together discussion.

You of course know where I stand in regard to the peridental abscess. In my paper in Duluth I called attention to the hematogenous origin of the peridental abscess in artificial or accidental devitalized teeth. In regard to the genesis of pyorrhea, I wish to leave a thought with you. I am coming more and more to the conclusion that it is a secondary manifestation. That is, it is a focus which is hematogenous in origin, just like the peridental abscess. As the bacteriological studies of pyorrhea improve, the percentage of streptococci in these reports rises higher and higher.

Pyorrhea is a disease of middle age—the period when foci are established, when sensitization to streptococci has taken place—when these foci manifest themselves in various parts of the body and the area in the gum adjacent to the tooth is one of these points of predilection. Pyorrhea thus stands as an embolic process in one of the end arteries of the gum, adjacent to the tooth. The reaction here is like the reaction in any other area of the body. There is produced a granulomatous mass which breaks down from lack of nutrition and establishes a sinus running along the tooth to the gingival margin. There is a great deal of wisdom in Doctor Kremer's remark that pyorrhea may be a barometer which measures the resistance or lack of resistance of the individual to streptococci.

ELMER S. BEST, D.D.S.: I wish to congratulate the essayist upon the good work he is doing in bringing to the attention of the medical and dental professions the vital relation that exists between infected roots of pulpless teeth and systemic disturbances of the most serious nature. These are the kind of papers we are badly in need of and we are particularly fortunate in having persuaded one of our members to open up this subject for us. The large attendance we have tonight from both the medical and dental professions is both a testimony to, and appreciation of the excellent work Doctor Kremer is doing. But I must say that I cannot agree with the conclusions he has reached in his observations; I fear he is too hasty when he takes it for granted that the "locus minoris resistentiæ" is an established fact or that the removal of the pulp of a tooth simply brings about a condition favorable for the proliferation of bacteria, and this, regardless of the quality of our operation. Also I must say that it is a surprise to me that the essayist can detect with accuracy an abscess cavity in interpreting a radiograph. Personally, I am able to tell that there is an area of lessened density of bone, but as to whether that area is infected or whether it contains pus, blood, or any other substance which would offer the same resistance to the X-ray, I cannot say, and it surely makes a vast difference which condition we are dealing with when upon our diagnosis depends the extraction of otherwise useful teeth and the disrupting of. a possibly otherwise efficient masticatory apparatus. Further, the essayist speaks of a perfect or an imperfect pulp canal operation as being apparent in a radiograph. He knows as well as I do that the X-ray simply shows mechanical perfection or imperfection in our operation and that we might deliberately introduce through the canal a most virulent organism and that the radiograph would show no such procedure, but that the result of this action would probably show up, and the essayist has not accounted for it. We are in the very beginning of this phase of our work and I feel that we must go very slowly and not create impressions that we may later have to change.

A corkscrew will never pull a man out of trouble.

In pursuing happiness, people are apt to disregard the speed laws.

A NEW TREATMENT FOR PYORRHEA ALVEOLARIS*

BY JAMES VINCENT SPARKS, D.D.S., INDIANAPOLIS, IND.

ONE OF THE MOST PERPLEXING conditions with which the dentist has to contend in his every-day practice is a typical case of pyorrhea alveolaris, and it is needless for me to attempt to picture the difficulties that confront the dentist who is called upon to treat such a case. You are all as well or better acquainted than I with what you have to contend and I am sure you will readily admit that it is one of the profession's great bugbears.

I am not ready to admit that the treatments that have been suggested in the past have been complete failures, for many of them possess points of merit. Yet it is true that with our present knowledge, radical cures are only effected at the expense of much patience, time and labor, and the unfortunate fact remains that not all cases that present themselves are cured or even benefited to any great extent.

Quite recently the profession has witnessed the advent of another remedial agent which, when coupled with proper operative measures, gives promise of very favorable results. In fact, the results so far reported may indeed be said to be even more than favorable. In some cases they are little short of being wonderful. I refer, of course, to the recent use of emetin hydrochloride, one of the alkaloids obtained from ipecac.

Doctor Barrett, of Philadelphia, in collaboration with Doctor Smith, of the University of Pennsylvania, has made an extensive study of the "Protozoa of the Mouth in Relation to Pyorrhea Alveolaris," and his preliminary report published in the *Dental Cosmos* would seem to indicate that his theory, with which you are no doubt all acquainted, is entirely rational.

Corroborative evidence as to the correctness of his deductions comes also from other well-known sources. The observations of Doctors Bass and Johns, of the Tulane Univeristy, are strikingly corroborative, and these reports are sufficient to warrant the belief that in emetin we have an agent that is worthy of a thorough trial and that Doctors Bass and Barrett are at least working in the right direction and along rational lines.

While it is admitted that the treatments outlined by Doctor Barrett and Doctor Bass differ in some respects, yet it is true that they are both founded on the same proposition that the underlying cause of pyorrhea is entameba, and that emetin is the best amebicidal agent at our command.

While the emetin treatment may be said to be still in the experimental stage and is too new to justify definite conclusions, yet the clinical reports that are so far available would clearly indicate that in emetin we have an agent that will do a great deal of good, even if it is not an absolute specific.

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*Read before the Indianapolis Dental Society.

It is well to remember that the findings of Barrett, Smith, Bass, Johns, Chiavaro and others coincide at least in one respect, namely, that in the purulent discharge from a typical case of pyorrhea, entameba were almost invariably present. In forty-six cases Barrett found actively motile amebas in the pus pockets and in eighty-five out of eighty-seven cases examined, Doctor Bass found the same condition. Because none were found in the mouths of patients whose gums and teeth were in normal condition it was reasonably assumed that these protozoans were responsible for, or at least were contributory factors in, causing pyorrhea.

It being generally conceded that ipecac or its alkaloids possess almost specific action in destroying the amebas of amebic dysentery and with the knowledge that amebas are almost invariably present in the pyorrheal discharges, it was quite natural to assume that ipecac or emetin would prove of value in the treatment of pyorrhea, and, as previously intimated, these conclusions seem to be quite well founded.

Undoubtedly you are all familiar with the suggestions of both Doctor Bass and Doctor Barrett. Briefly, they are about as follows: The Barrett treatment consists in the introduction of a one-half per cent. solution of emetin hydrochloride directly into the pus pockets with a hypodermic syringe, making the injection directly into the pockets and leaving the pockets filled with the solution as the needle is withdrawn. These injections are made every day or every other day until the gums have resumed their normal condition.

The Bass treatment consists in the injection hypodermatically of one-half grain of emetin hydrochloride into the arm, or other convenient part of the body, every day for three or four successive days, and then, after waiting from four to seven days, this treatment is repeated and is continued in the same alternating manner until the gums are healed. The degree of peridental membrane destruction will determine the length of treatment which may be for a few days or may require months. The object of repeating the treatment at intervals is to destroy any encysted amebas or amebas that were not fully developed at the time of the former treatment, and also to prevent reinfection before all the gum lesions have had a chance to heal.

Results from both treatments have been highly gratifying, but it would seem to me that the ideal treatment, if we are to use emetin hypodermatically, would be to adopt a treatment that embodies both methods; or, in other words, begin the treatment by injecting the gums by the method proposed by Doctor Barrett and then continue the treatment along the lines suggested by Doctor Bass.

While it is not my intention to discourage the use of emetin by either of these methods or by a combination of both methods, for I believe them to be a long step in the right direction, yet I am frank to confess that my experience with emetin given hypodermatically has proven rather disappointing—not because of a lack of favorable results, but rather because of the great difficulty in inducing my patients to submit to the use of the hypodermic needle. It cannot be denied that such injections are painful and we are nearly all cowards when called upon to endure pain. True, a great deal of it may be psychologic, but the fact remains, however, that in my own brief practice, my patients were very reluctant in returning for continued treatment notwithstanding the fact that each case showed much improvement. These difficulties may, of course, be overcome in many cases, but we must all admit that if the same results could be obtained by the ordinary methods of administration, that is, by the mouth, our patients would be better satisfied and there would be less difficulty in inducing them to return for subsequent treatments and examination.

This problem was one that I considered of sufficient importance to warrant investigation and at the suggestion of Eli Lilly & Company, I was induced to try an ipecac combination which they offer under the title of "Alcresta Ipecac Tablets," and the object of this paper is to acquaint you with this remedy and the results that I have so far obtained.

It is a well known fact that some of the other alkaloids of ipecac besides emetin possess marked amebicidal properties and in ipecac itself we have an agent that has proven of value in amebiasis wherever it could be used.

The difficulty of administering ipecac, however, has been because of the fact that doses sufficient to cause the destruction of amebæ would cause severe nausea and vomiting. Various means have been devised to overcome this difficulty, but until quite recently none have been a complete success. It is for this reason that clinicians have resorted to the use of the ipecac alkaloids by the hypodermic method.

Recently Prof. John U. Lloyd discovered that a pure hydrated aluminum silicate has the property of absorbing alkaloidal salts from aqueous solutions, that is, taking them up as a sponge would take up water. These salts do not combine chemically with the reagent but exist as absorption compounds and are released only in an alkaline solution or media.

Ipecac, when treated with this reagent (which has been given the name "alcresta") readily gives up all of its alkaloids. The precipitate, when collected and dried, can be administered in substance or can be made into tablets that contain the alkaloids from a definite amount of the drug.

As previously stated, these alkaloids are released only in an alkaline media and as the normal condition of the fluids of the stomach is acid, it follows that the action of the remedy is not manifest until it has passed through the stomach into the intestines, where the fluids are alkaline, and the alkaloids are released. Thus we obtain the full amebicidal effects of the ipecac alkaloids without nausea or gastric disturbance, and moreover by this method of exhibition there is practically no limit as to the dose that can be given.

With this information at my disposal I gladly welcomed the opportunity to employ "Alcresta Ipecac Tablets," which contain in each tablet the alkaloids from ten grains of ipecac, in the place of emetin hydrochloride by hypodermatic use.

While I have not had an opportunity of giving them a trial except in a few cases, yet in every instance where I have used them the results so far have been little short of marvelous and have exceeded my fondest expectations.

The treatment that I have employed is substantially as follows: After having scaled and polished the teeth, two tablets are given three times a day one-half hour before meals for six days. After a lapse of a week this treatment is repeated and this plan is continued until satisfactory results are obtained. Marked improvement in every case followed after a few days of treatment by the above method.

It might be proper to state at this point that Doctor Bass has recommended the use of fluid extract of ipecac as a prophylactic measure, placing a drop or two on the tooth brush when the teeth are washed. As emetin in a solution of 1 to 100,000 or less has decided amebicidal properties, it would seem to me that an antiseptic mouth wash in which emetin was one of the constituents would be of much service during the administration of the tablets and also as a prophylactic to prevent pyorrheal infection. Such a preparation could be used in our spray bottles. I have not tried anything of this kind, but it appeals strongly to me and I believe it is worth our careful consideration.

My purpose in reading this paper has not been to give you specific case records but instead to lay before you the results that I have so far obtained in the hope that others will investigate and that as a consequence the profession will be benefited. My experience is such that I am confirmed in the belief that in "Alcresta Ipecac Tablets" we have an agent that is just as effective as the emetin injections and at the same time possesses the decided advantage of being easy and convenient to administer.

Just one further observation on this subject: The ease with which this treatment can be continued may lead the layman to practice self-medication and thereby deprive the dentist of his well-deserved fee, but I am sure that none of us will begrudge the individual who is so unfortunate as to have a typical case of pyorrhea the relief that is possible, even though a fee is not in sight. However, the dentist will have no great difficulty in overcoming most trouble of this kind, for he may dispense the tablets himself and he can insist that his personal observation and the application of local treatments are important factors, as indeed they are, in securing the desired end. Here the mouth wash suggested above, used in one of our spray bottles, could play a very important part both from a therapeutic and a psychologic standpoint.

DISCUSSION

DR. HOWARD R. RAPER: First, let me say, for the benefit of those of you who may not know, Doctor Sparks is a 1914 graduate of the Indiana Dental College, and as a teacher of that institution I may say I am rather proud of him. It was at my suggestion that he wrote the paper you have just heard. He was somewhat reluctant to consent to address this society, saying he feared its members might think it presumptuous for one so recently graduated to attempt to counsel or teach older and more experienced men. It is unfortunate, particularly for the older men, that this is the attitude of our youngsters in the profession. As a bald-headed exponent of the older crowd, let me say I like to hear and I pay particular attention to what young men have to say. They are so bluntly honest, so delightfully free from tact, so anxious to be fair, so confoundedly full of health and energy. They are the men who, some day, will demolish our prettiest, present-day theories, just as we in our time have demolished many of the ideas and practices of our predecessors and replaced them with new, better ones. The man who is out of tune with young men is out of tune with progress. Let us have more papers from the boys just out of college who have not had time to forget the thousand and one things we all should know but have forgotten.

I like the general tone of the paper; it is clear, concise, conservative.

The suggestion that we combine local and general treatment, giving first the local injections of the one-half per cent. solution and following this with the administration of alcresta ipecac tablets, seems rational. It is not unfair to suppose that there may be amœbæ deep-seated in the tissues which would not be devitalized by injection of the emetine hydrochloride solution into the pus pocket, but which would be destroyed if a sufficient quantity of the drug circulated in the blood. Nor does it seem unfair to me to assume that it would be unwise for us to depend on the necessarily small content of the drug in the blood stream to destroy all amœbæ present in pus pockets. The combination of the local and general treatment then seems best.

Doctor Sparks fails to warn you of any untoward effects of the treatment he suggests. Perhaps he has had none. There are, however, certain slight hazards attending the employment of the amœbicidal treatment which should not be overlooked.

Care should be taken when injecting pus pockets with emetin that the patient is not permitted to swallow the excess of the solution which passes into the mouth from the flooded pocket. A small quantity of the solution swallowed will produce nausea and emesis.

Though emetin hydrochloride is not at all escharotic—not in the sense that phenol is escharotic by way of comparison—I have nevertheless seen two cases of rather severe stomatitis following the repeated use of a one-half per cent. solution. I am not prepared to say definitely that the emetin produced the stomatitis in these two cases, but I am at a loss to know what did produce it if the emetin did not. The symptoms were identical and distinctive in both cases. The lips, cheeks and tongue were more affected than the gums. The first patient described the condition very tersely and perfectly by saying, "The whole inside of my mouth and my lips feel chapped." The use of the emetin was discontinued and the following was prescribed for both cases:

Liquid albolene	fl℥II
Phenol	MII
Menthol	aa
Thymol	Grs. II

M. Sig.—To be used in an atomizer as often as desired.

I do not claim that this formula is an ideal one for emetin stomatitis, or even that there is such a thing as emetin stomatitis. It was prescribed because of its emolient, demulcent properties in only two cases. More experience may teach me that liquid albolene alone is better than the mixture. Because these cases are still under treatment, a further report on them is impossible.

This covers the possible dangers of the use of emetin locally, viz.: the production of nausea and stomatitis.

The administration of one-half gr. emetin hydrochloride hypodermatically may produce some irritation at the point of injection, which subsides without treatment.

The administration of alcresta ipecac by mouth may produce diarrhea. This is much less likely to occur in women than in men, the former, as a rule, being less susceptible to the cathartic action of any drug. When diarrhea occurs the dose should be reduced or the administration of the drug discontinued entirely according to the severity of the diarrhea.

DOCTOR HASKETT: May I ask, have you ever noted a reaction, a rise in temperature, malaise, aching muscles, etc., after the administration of the drug?

DOCTOR RAPER: No, I have not made the observation.

DOCTOR HASKETT: I have taken the drug myself and have experienced such a reaction.

DOCTOR RAPER: As Doctor Sparks says, this treatment "gives promise of very favorable results." This much, but no more, can we say for it at the present time.

Earlier in the evening somebody handed me an advertisement of a pyorrheal remedy composed of a mixture of a bacterine (so-called vaccine) and emetin hydrochloride. The bacterines are not as popular as they once were. Listen to this as simply one man's opinion, and I will say they are worthless and dangerous. The emetin treatment is so new we know very little about it. A "shot gun" of the two, therefore, seems an unsafe remedy—one with greater possibilities for harm than good.

DR. CARL D. LUCAS: It affords a source of great pleasure to me, personally, to hear one of our recent graduates of the Indiana Dental College come before this group of old practitioners and spring a new theory, which is, from his report, not only theoretical but practical.

It may be somewhat out of place for me to report a case of pyorrhea which was treated by local injections of emetin hydrochloride, but the case is of sufficient interest for me to infringe on the regular order of affairs.

A patient reported at the office who had been suffering for years, and upon examination I found that pus could be compressed from each tooth socket. I proceeded to scale the local deposit from the teeth as best I could accomplish this for a first sitting and then injected emetin hydrochloride into all the pockets. The patient reported one week later and the characteristic pyorrhea pus odor had disappeared and I was surprised to notice that pus could be compressed from only two sockets. The character of this pus was entirely different from what it was the week previous. Instead of being a creamy consistency and color it had a white color and was mixed with considerable serum. These two pockets were treated by scaling the two teeth thoroughly followed by an injection of emetin, not only in these two pockets but into all the pockets which could be found. The next time the patient reported there was a slight discharge from these two pockets which I found was due to faulty scaling of the teeth. I proceeded to remove this deposit and the deposit which I had overlooked upon the other teeth and made a third injection. The next time the patient reported I gave a thorough prophylactic treatment and injected emetin into the pockets, which were then practically closed.

This patient reported three months later for prophylactic treatment and I could find no pus in her mouth.

Before the first injection of emetin was made I made a microscopical examination and found the coagulated amœbic parasite. Another examination of the discharge was made toward the close of the treatment and the parasites were entirely absent.

I have found it necessary to use a warmed stage microscope in the microscopical examination for demonstration of the amœba and in all of the cases which have the characteristic pyorrhea pus odor I have been able to find the coagulated amœbic parasites.

Doctor Sparks' report certainly deserves our careful consideration and he is to be congratulated upon his timely efforts.

DOCTOR HARVEY: I do not know of anything in the whole realm of our profession which I know as little about as I do of pyorrhea. As a student it was one of the first words in our nomenclature which I learned to pronounce as it appealed to me on account of its musical quality. It provided me with an agent to use when promulgating my knowledge of dentistry. I learned of it under various names and synonyms, but the only name which seems to have withstood the changing disposition of our lexicographers seems to be pyorrhea. But what of the treatment?

I have used emetin in my treatment of this condition with varied success and I believe the cases have improved under such treatment more than anything I have ever used, although I do not feel safe in calling them cured.

My method of medication has been the introduction of a one-half per cent. solution into the pus pockets by means of a hypodermic syringe. Medication by intestinal assimilation seems to be rapidly becoming obsolete in the realm of medicine for the treatment of those specific conditions in remote parts of the body. Instead of the old method of giving in tablet and pill form the various mercurial salts they are now given hypodermatically, thereby enhancing the action of the drug and getting rapidity of action. Even in the pernicious anemias the tendency is to apply the medication direct hoping thereby to get a more pronounced action.

Emetin isn't the only alkaloid of ipecac, there being others which are even more irritating to the intestinal tract than the emetin element. Therefore, in using large doses of ipecac even in the form of alcresta ipecac, which is soluble in the alkaline media of the intestines only, we may effect some irritation and hence some diarrhea.

The giving of tablets to a patient with directions for their administration is conducive to self-medication, as the layman is aware of the fact that tablets are manufactured and can be purchased in the open market, which may encourage him to eliminate the dentist who is, in his mind, the middleman; all of which may tend to hamper honest and ethical treatment of the disease.

FRACTURE OF THE MANDIBLE*

BY DR. J. P. WAHL, NEW ORLEANS, LA.

CHIEF OF THE DENTAL STAFF CHARITY HOSPITAL N. O.: PROF. OF TREATMENT OF FRACTURES
OF THE MAXILLAE, NEW ORLEANS POST GRADUATE SCHOOL OF MEDICINE: PROF. DENTAL
TECHNIC AND FRACTURES OF THE MAXILLAE, LOYOLA SCHOOL OF DENTISTRY

THE MANDIBLE, OR LOWER JAW, owing to its position, is a kind of guard to the rest of the face, and is more exposed to violence and consequently more often fractured than any other bone of the face; but owing to its loose connection with the skull, is less liable to be complicated by skull or brain injury than a fracture of the upper jaw.

Fractures of the lower jaw may be either simple, double, triple or compound. A compound fracture is one which involves a break in the tissues or where the fracture communicates with the mouth cavity.

For treating fractures of the mandible there are various forms of interdental splints, etc., but before any can be used satisfactorily a complete study must be made of the direction of displacement, which displacement is always maintained or modified by the action of the muscles which are attached to it.

The action of the muscles on an intact jaw are very nicely balanced, but when a fracture occurs, the action of certain muscles is no longer equally balanced and displacement is produced. When a fracture occurs vertically at the symphysis the muscular balance is very little if at all disturbed, and in a great many cases is very hard to diagnose as there may be no displacement.

In fractures of the body between the symphysis and the angle (Cut 2), the smaller fragment will be drawn toward the median line by the action of the portion of mylohyoid muscle, which is attached to that part, while the whole of the mylohyoid of the opposite side together with the muscles attached to the symphysis will draw the mental portion of the fragment backward.

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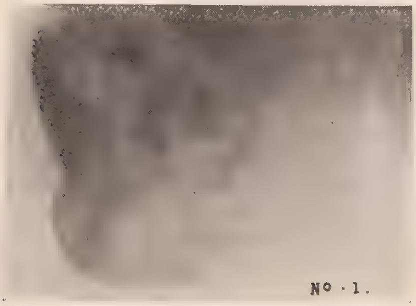
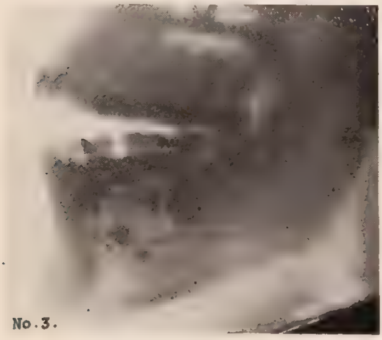
*Read before the Louisiana State Dental Society, 1914.

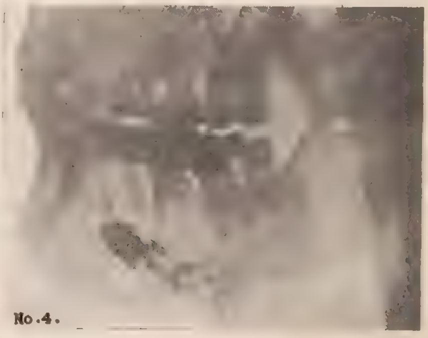
If the bone is fractured on both sides, the mental fragment might be pulled backward, while the direction of the line of fracture might be such as to prevent displacement entirely (Cut 3). In fractures of the angle the body is usually drawn backward. Due to the fact that the muscles which are attached to the inner surfaces of the maxilla have a lower plane of attachment at the hyoid bone; the direction of the force of pull is downward as well as backward.



No. 1—Showing fracture between symphysis and the angle; smaller fragment being drawn upward and forward, and larger backward and downward.

No. 2—Showing a fracture in the location of the cuspid tooth, the most common site of fracture.





No. 3—Showing fracture and badly shattered mandible, due to gun shot wound.

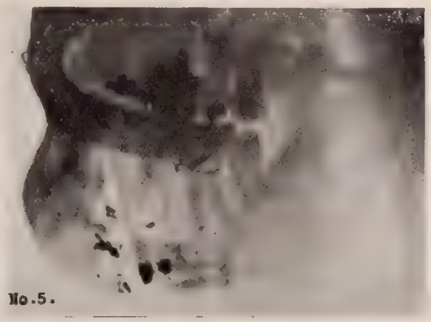
No. 4—Showing same jaw after splint was applied, before extraction of bullet.

In the normal jaw the temporals, masseters and internal pterygoids neutralize the downward pull of the muscles attached to the hyoid bone. But when a fracture occurs between the angle and the symphysis of the fragment unless prevented by the line of fracture, is drawn downward and backward, and in selecting a splint one must be selected which will prevent this displacement if it is to be satisfactory.

From our study of anatomy we know that the muscles of mastication are attached to the ramus of the jaw and its processes. The masseter, the temporal and internal pterygoid enable us to close our mouth, while the external pterygoid helps the mandibulohyoid muscles in opening the mouth.

The displacement of a fragment in this location depends on the amount of attachment these muscles still have to the fragment. The masseter being the most powerful might in cases of fractures in front of the angle cause an outward tilting of the ramus. In cases where the fracture is in the ramus itself, there is as a rule very little displacement.

Because of the tooth sockets the mandible is more often broken in the body of the bone than in the ramus, and principally so about the cuspid tooth, since it is the longest rooted tooth and naturally the location of the *deepest socket.*



No. 5—Showing same jaw after bullet was extracted.

DIAGNOSIS

In fractures of the body of the bone where a number of teeth are present the diagnosis is usually very simple, as displacement in the normal occlusion usually occurs, but in fractures behind the angle, diagnosis is best made by the aid of the X-ray. The seat of fracture can usually be diagnosed by localized points of tenderness along the body of the bone.

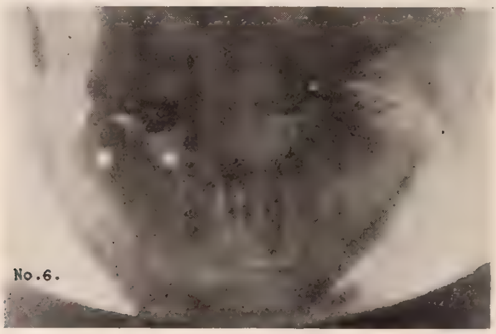
In a fracture at the symphysis there might be no displacement, but by pressure exerted on the jaws at the angles, will cause discomfort and pain at the chin, owing to the force transmitted through the bone to the site of fracture. If a fracture is near or above the angle it is best determined by a backward pushing on the chin and drawing it from side to side.

TREATMENT

The treatment of a fracture of the mandible involves two objects: the care of the tissues and the replacement and maintenance of a correct position of the parts, the latter of which is accomplished by holding the broken fragments in their proper relation to the sound jaw and thus indirectly with each other, by means of dental splints, wires, etc., to fix the broken fragments to each other.

Indirect fixation could only be used where there is a full or nearly full set of teeth in the uninjured jaw, and is usually, or I might say wholly, employed by the physician. This method is to bandage the lower jaw to the upper with a four-tail or Barton bandage, but as this bandage presses backward on the chin, it only tends to bring about displacement and thereby causes disfigurement, which no doubt a number of you have observed.

The direct fixation is best brought about by the dental splints or wiring the upper to the lower. In my experience with a vast number of hospital cases, in some of which the bone was very much shattered, I never saw a case where wiring the ends of the bones or putting in steel plates was necessary.



No. 6—Showing disfigurement after five months' treatment by a doctor of medicine; notice the space between the upper and lower incision; great loss of masticatory function

In a fracture of the ramus you can get marked success with the mandibulois maxillary splint as the broad muscular attachment on its surface usually prevents displacement when the body is held in its normal position.

There are several interdental splints or methods which we might employ for direct fixation of the fragments. If the break occurs in the body of the bone any place in front of the second molar, there is no necessity of the indirect method, as a very simple interdental splint can be made of some suitable metal and cemented or wired in place, causing no discomfort to the patient and permitting them to take the proper care as to cleaning, etc., which is an absolute necessity.

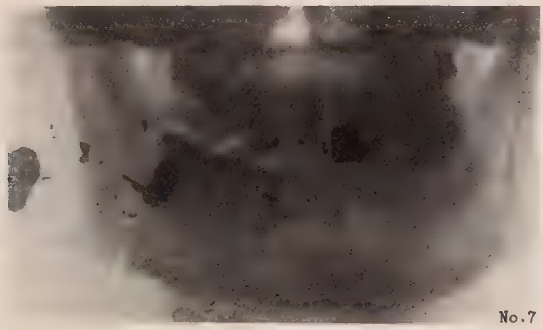
I will try in as few words as possible to describe the method of making a simple interdental splint, say for a case where the fracture occurs at the site of the cuspid tooth, without a break in the tissue.

First, it is necessary to take a good impression of both the upper and the lower jaws. It is best to take the upper in plaster so as to get an accurate impression. Now the lower may be taken in either plaster or modeling composition, or a rough impression can be taken in modeling composition and then cut out a sufficient portion of the inner surface, fill with plaster, return to the mouth and by this method you can obtain a very sharp and correct impression.

In taking the impression, if the displacement is very pronounced it is better to take it in sections. No attempt should be made to hold the parts together while taking an impression, as the setting of the bone will be done after the appliance is made and such an attempt would only be loss of time.

After pouring the impressions, the cast of the lower is sawed in two on a line with the fracture. The teeth of these two pieces are then carefully occluded with those of the upper model and the parts cemented or waxed together.

In occluding the parts, great care must be exercised to obtain the correct occlusion, as the slightest difference in the occlusion will cause a failure of perfect adaption which would result in the fragments not being held squarely together, thereby resulting in an undue pressure being brought to bear upon them at one point, while at another they will not touch; at the point of too great pressure inflammation will set in and death of the bone will follow. Union in such a case might take place, but if it did there would be a faulty occlusion.



No. 7—Showing fracture at angle, result of gun shot wound.

The model, after being cut and cemented, represents the jaw previous to the fracture, if properly occluded.

A die is then made of zinc and a counter die of lead, and a piece of 28-gauge gold, silver, copper or German silver is struck up to fit nicely over the teeth for a good distance on either side of the fracture and extend well down on the teeth to the gum line: this is well trimmed, the front is reinforced with a half-round gold or German silver wire to give it strength, all rough edges are smoothed and polished and little holes are drilled through the occluding surface so as to permit an easy escape of excess cement. Splints might also be made of vulcanized rubber by casting in aluminum or other suitable metal.

The splint is now ready to be placed. The mouth should be thoroughly cleaned or as nearly so as possible, all tartar removed and the splint cemented in place. It is often advantageous to put on a Barton bandage until the next day, so as to give the cement time to thoroughly harden and prevent the displacement of the splint.

In conclusion, it is well to bear in mind that fractures of the body of the mandible are usually compound—meaning as stated in the beginning of this paper, a break in the tissue, or one in which the fracture communicates with the oral cavity—fractures of the ramus are usually not open.

Open fractures are more or less always exposed to infection, and as a protection against infection it is always well to bring about drainage externally by means of a stab wound and a small drainage tube that will communicate with the break, made under the jaw or chin.

An ice bag applied over the site of fracture so as to cool and not freeze will greatly limit the inflammation and pain.

Fragments of bone should not be removed until they become completely detached.

We should always try to save as many teeth as possible unless they interfere with the approximation of the fragments.

It usually takes about three weeks for single fractures to unite where there is none or little suppuration; but where the bone is lost or badly shattered, it will take much longer. One case where the bone was very much shattered by a gun shot wound required six months to unite. Delayed union may be brought about by poor approximation or lack of stability, or by infection or by some fault in the vital reparative supply.

Syphilis, tubercle, pregnancy, or any general depression might cause delayed union. It is also well to bear in mind that the patient must be well nourished with soft foods, chopped meats, plenty of milk and eggs.

Fractures of the maxilla and mandible should be handled by the dental surgeon, and not by the physician, and we as dentists should devote more of our time to hospital work so as to familiarize ourselves with this special work.

CAVITY PREPARATION WITH CONDUCTIVE ANESTHESIA*

BY DR. R. M. HUBBARD, INDIANAPOLIS, INDIANA

I removed the nerve from a molar, upper second, also an upper first bicuspid, prepared other cavities in vital teeth, all before groups of men, with perfectly satisfactory results. All who saw these clinics were more than pleased with the operations. Two of the patients came back next day with good reports and delighted with results.

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*Office clinic, Indiana State Dental Society, 1914.

HIGHER PROFESSIONAL STANDARDS*

BY G. L. POWERS, D.D.S., PARIS, TENNESSEE

IT IS WITH MUCH PLEASURE that I come before you with the subject of "Higher Professional Standards." Possibly I shall not present matters as you see them, but if we all agreed along general lines, we should not make much progress. I hope we can all together drive something out—or in.

ADVANCES IN DENTISTRY

Within a very limited time our profession has made great advances. I sincerely believe we are doing more good for our people, from a standpoint of health and its resulting phases, than any profession extant. We are not only blotting out caries and pathological conditions, already existing in the oral cavity, but we search, study, and relieve associate disorders of the whole system. We relieve more stomach, heart, neuralgic, kidney, lung and bowel disorders, directly and indirectly, than any of our associate professions. How many throat, eye, nose, ear and lingual troubles do we relieve—I mean permanently?

At the present time we are doing research work leading to the prevention of diseases. Rather than correcting troubles already prevailing, we are devoting great time and study to prevention, showing that our field is great and that the profession we represent has done great things. Dentistry can not but be a sacred and noble profession.

INDIVIDUAL RESPONSIBILITY

It is certain that we are living in a progressive age—more so now than ever—morally, professionally, industrially, politically and in general. So, to maintain a higher professional standard we must observe, study, attend all association meetings we can and exchange our ideas and opinions for mutual advancement. We must know better how to accurately diagnose and treat diseased conditions as they obtain.

Much as our fathers did, more is, and should be, expected of us today. We must get in touch with and reach the many doctors of dentistry who do not attend and get them out to our societies. Unless we attend these meetings, we simply go backward and get into too many undesirable and expensive ruts.

It is essential that we keep in mind that other parts of the body are associated intimately with the functions and pathological conditions of the oral cavity and teeth. It is essential that our profession maintain to the public that we are not simply filling cavities in teeth, but that we know the physiological and pathological conditions of the general system and treat not only the teeth and the oral cavity, but all associated troubles. That we are extending the length of life and the happiness and comfort of the human race.

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*Read before the Tennessee Dental Association, 1914

We do not propose to simply go into an infected field, cure the diseased subjects and leave the sound ones there in the field of infection; but we do propose to diagnose, relieve and restore to their normal function the diseased conditions, disinfect the field, find out the cause and stamp out its very existence. We are entrusted with a great cause, our responsibility individually is enormous, and we must take to the greater opportunities and strides. We can, individually, extend to the public our mission.

Could we not have a more formal effort whereby we could extend our usefulness more into the schools, preventing the infection and spreading of contagious diseases?

ORAL CLEANLINESS

This should be correctly taught in every home and school room. Within the unsanitary mouths of the children are carried the germs of most all the contagious diseases to which our schools are so susceptible. Many of our cities are making great advancement along this line. By inspection of the mouths of the school children and correction of the same, great relief is obtained. Many children cannot advance in school, or in general, on account of diseased conditions of the oral cavity, resulting in numerous general troubles. When these troubles are relieved they develop normally, but in many of the schools the dental inspections are made by physicians and nurses. These people do the best they can, but you know, and they know, they do not know enough about oral abnormalities and teeth to do this work. All such work should be done, as in most places it is done, by competent doctors of dentistry. We know that 95% of the school children have defective teeth and mouths, with all their resulting disturbances. There are not enough dentists in the country to attend even the children's teeth that need their services, but every city and community should have an effective dental inspection and relief, thereby raising the standard of our mental, physical and moral beings. We would have much less crime and our cities could well afford to provide for such relief.

Science has demonstrated the great influence the teeth and oral conditions have upon the human body. Sanitary mouths are recognized as an absolute essential in maintaining health and preventing disease. In sanitary mouths bacteria cannot thrive. It is gratifying to know the medical profession recognizes us as effective factors in the matter of general health and the association of the two professions in these matters is productive of general good.

DENTISTS THEMSELVES

As much as has been accomplished, we are simply on our way. Within the next few years, with our energies, present knowledge, research work and general progressive spirit, no one can foretell the limit of the dental profession. Considering ourselves individually, what are we doing? Some of us are succeeding; some failing, perfectly. When we go into some offices and see what they contain we can very readily understand why some of us are failures. Many fail and do not know why. Could these same men stand on the street corner and watch themselves pass by a few times, it would do them much good. If we could only see ourselves and offices as others see the same no doubt many changes would be effected.

Can we hope to succeed when our personality is repulsive? Can we succeed when our faces, hands, mouths, clothes, morals, physical condition and general character are not up to a high standard? Can we succeed when we are always pessimistic and always criticising? Can we hope to succeed unless we are willing and full of optimism? Can we succeed when we simply live within the four walls of a small office, dingy and unkempt?

Can we succeed unless we inform ourselves, are pleasant in all our associations and take part liberally in matters of high character concerning the public?

Can we succeed with dirty linen and beardy faces? Every dentist should shave every morning. Clean hands and well pressed clothes are mighty good investments.

Can we succeed unless we have self respect and confidence in Self and the public? It is absolutely necessary to back and hang to Self and our profession. In order that we may do this we must be competent and have visions and thoughts that amount to something. Too many of us are simply afraid to let ourselves out. Should it be necessary, we should turn everything on and get the ginger. We've got to have it.

Many times do we see teeth and other trouble conditions absolutely lacking in care and relief from the fact that the operator was afraid to extend the field of operation and apply the remedy. Personally, I do not think our standards are too high. They are not high enough. Some of our colleges let the standards drop so they may get students. This is disgraceful and to be regretted. Our colleges on the whole maintain high standards, to their and the profession's credit. It seems that our colleges could do a great good by giving students instruction upon matters pertaining to the entry of graduates into practice and the matters which they have to face there. There is the one great weak spot of most of our graduates. These things they usually have to dig out for themselves, as it now stands.

FINANCIAL STANDARD

From a financial standard, are we making good or not? Gentlemen, this is a serious matter with us as a profession. Have we reached that point where we can save money? If we have, do we do it? Upon this one question rests, to a great extent, our material comforts. Our homes and the welfare of our wives and the culture, education and training of our children depend upon this question. Have we, or can we, get into condition to withstand the period of inactivity? As certain as death is this period of inactivity, and sooner or later, gentlemen, it will come to the very best of us.

One of the most pathetic scenes in the field of dentistry is to see one of the members of our profession, who has gone through all the struggles of life down to that period of inactivity, out of commission and possessing no financial means upon which to go.

Where have we any assurance that we shall live beyond this present moment? Should it come to pass that we should cease to exist, where would those chubby hands and bodies of those little ones and that dear wife and all those who are dependent upon our efforts for the comforts and necessities of life, look for existence?

Since we have been entrusted with so much and so many responsibilities, does it not seem reasonable that we are accountable for their future destinies?

Considering the progressiveness of our profession, its increased demands, and the progressiveness of the general cost of living, it is simply up to us to be financiers or failures. Our financial success means much to us from a general community standpoint. Haven't you noticed that every one respects and places on a higher standard the man in any vocation who can "get by?" I maintain that any professional man who has a good financial standing can render better service to the public.

We must uphold the dignity of the profession from all standpoints. If we would, study and investigate more! We must keep in touch with outside matters and know when and how to invest our money (if we have any). Do you know, gentlemen, when a man comes into our cities and communities with "blue sky" to sell, we as dentists are among the first men he calls on? We are considered easy marks, and it is simply up to us to more conservatively invest our money and stop wasting our funds. The safest proposition I know of, if we are in a live city, is real estate. If we live in a place where property, rents and matters in general are low, our dental practice will be on the same basis. In this case the best thing to do is to move. A wide-awake place, or a move to one that is alive.

COMPETITION

Are we recognizing that our general expenses are 50 to 100% increased over ten years ago? Aren't some of us charging the same fees we did then, thereby admitting that we have not made one speck of progress or advancement along the line of obtaining, by study and experience and general development, more knowledge and greater rapidity of applying it; that although everything else is progressing you are strictly non-progressive? Any one who considers himself worth no more now than he was ten years ago, possibly when just out of college, has simply drifted into the wrong profession. But what profession would he suit right well under these "pulling back" tactics?

It is simply appalling the measly fees some of the members of the dental profession get. It is shameful the offices some of us keep. No wonder some are starving. Don't you know, personally, every day, of patients who are falling away from dentists simply because of the unsanitary surroundings in which they do their operating and the miserably low fees they ask for their services?

Don't you know many cases where patients left the other man because his prices were so low they were afraid to trust him, since he indicated by his dinky, all-drawn-up fee that he hadn't much respect for the service he was rendering? They know the dentist himself is in good position to know what value to put upon his services and they certainly do not think more of his ability than he indicates.

Don't you happen to know some men, as unreasonable as it may seem, who do not charge for treating teeth? Do you not know of some who extract for plates, do not exact a fee at the time, and possibly never see that patient again? Don't you know of men who are putting on crowns and doing other service for starvation fees?

These scatter-brain methods won't get anybody far and we ought by some means, reach these men and equalize our professional standard. They are securing what they feel they are worth in some cases and some others know they are worth more, but are afraid to ask it. Some of them are not really worth what they are getting. They ought to quit.

The public deserves better dentistry and not one of our profession is called upon to distribute such measly service. You understand, these are exceptional cases, but they do obtain. I am simply calling attention to the violations of higher standards. We should get these men to our societies and all exchange ideas for our mutual enlightenment and raise our standards along the whole line that we may better dispense more valuable service.

If we would know more we would have more to sell. How can a man ask the public to pay for something he hasn't got in stock? We should get results and raise each other to higher intelligence. Our local dentists should cultivate each other and be of assistance, rather than knock each other. We should be honest with ourselves and with the public. We should not even attempt to exact good fees unless we first know that we are thoroughly competent and able to render service in ratio to the fees asked.

LOCAL CONSIDERATIONS

Sometimes we see cases where one dentist feels that in order to succeed best he must knock one or all of his contemporaries. Many times he feels that he must charge less than the other man. Now, gentlemen, I maintain that the best way to fail, and to fail right, is to do the things just mentioned.

When can we ever learn that we cannot thrive by promoting the other man's faults? When that we can succeed on merit and merit alone? The least we can say about our competitor the better. Rather study him more and speak kindly of him.

In the field of competition we should get our minds off the little things and recognize the greater responsibilities we carry. Do we not carry the health of our patients within our hands and heads? Picture the service you can render and the benefits your patient derives. Realize the increased power of mastication. Do not fail to appreciate the relief from the dangers of the constant army of bacteria which infect and inhabit the decayed teeth and unsanitary mouths; the restoration of the diseased and lost parts toward nature.

Many times patients threaten us with the other man as being cheaper. Don't let these people cause you to lose your dignity, lower the standard of the profession, slash prices, rob your family and self and get you in the habit of skinning your service to the patient.

Simply: "Mrs. Jones, I would be glad to attend your teeth and render you the service you need, but I cannot do it cheaper. You can possibly get it done cheaper, but at that, you usually get only what you pay for. I do not let other men's prices be adapted to my service. I try to keep informed and make great efforts to see how well I can do my service, rather than how cheap. I had rather try to do matters a little better than anyone else, if possible. I always render the very best service possible and charge as reasonable a fee for the same as I can, but it is absolutely necessary that I have a reasonably good fee so that I may serve you better. That is the situation; I cannot reduce my fee, but I shall be glad to serve you, if you so desire. Otherwise I feel just as kindly toward you."

Instead of relating the high cost of materials, let us get a higher, more professional standard. The least and weakest appeal on this earth is the material proposition.

We, as professional men, are not dispensing materials. The cost of all our materials is infinitesimal and I would that we could never again hear that tale perpetrated.

Dental skill is what we have to sell and the public is not concerned whether we use ten cents' or eight dollars' worth of materials. They want us to relieve their troubles with our heads. Unless we do relieve conditions as we find them with our intelligence, we are simply swamped. People do not appreciate nor desire a cheap head. When will we all learn to render high-class service and get fees in proportion?

The man who can establish a reputation for high standard ability and service, is considerate of his patients' welfare every moment they are in his care, and a high standard of fees to all in ratio to services rendered (though he be the highest in his city or community), is the man who "gets by."

We must keep a high standard, serve the public well, save the teeth, not extract them, render efficient service to suffering humanity and we should not worry considering the remuneration. If we can only stimulate each other to higher professional standards, shall we not serve the public better?

URIC ACID AND ITS RELATION TO PYORRHEA*

BY DR. J. L. MEWBORN, MEMPHIS, TENNESSEE

THE LITERATURE OF MEDICINE, thirty-five years ago, seems to have shown conclusively that an excess of uric acid in the blood, as a waste product, was emphatically the cause of a very large number of diseases which could not then be accounted for in any other way.

From these conclusions and declarations the baneful effects of this toxin were recognized in nearly every department of medicine, including that of dentistry.

Nutrition is the transformation of non-living molecules into living cells, which undergo chemical changes with oxygen, producing waste material that in time is thrown off to make room for fresh cells. When these conditions of cell formation are modified by age, food, occupation, marriage, consanguinity, climatic and hygienic influences of environment, and these modified conditions, continuing to exist in a direct line for a few generations, a morbid tendency may be entailed on progeny of individuals to functional alterations of nutrition, causing a predisposition to idiopathic conditions known as diatheses.

Three diatheses at least are now admitted: the scrofulous, or a predisposition to the deposit of tubercle; the cancerous or predisposition to many forms of cancer; and the arthritic, or a predisposition to diseases caused by disturbed process of nutrition.

The term uric acid diathesis, strictly speaking, is only a subdivision of arthritic diathesis. Under this head are included all diseases due to faulty metabolism, such as obesity, all calculi, whether biliary, renal, pancreatic, salivary and serumal, diabetes, anemia, sciatica, constipation, gout, rheumatism, Bright's disease, Riggs' disease, asthma, paralysis, heart disease and death.

Uric acid is one of the organic acids formed in the economy and is found in the urine of all animals, even to the lowest order. It is found in the excrement of birds, snails, reptiles and insects. Scheele discovered it, 1776, in urinary calculi; Wallaston, in 1797, discovered it in gouty concretions, and in 1885, Dr. Reese, a dentist of Texas, discovered uric acid crystals in salivary calculi on the teeth.

The great Fothergill and Garrod taught that uric acid was formed by the metabolism of nitrogenous waste, and the liver was the organ in which the process of formation was carried on.

Haig, of London, on uric acid, claims there is some relation between the formation of the two waste products, urea and uric acid. In health their relative quantities excreted are constant. If this ratio is disturbed, there is a noticeable deviation from the standard of health. Also, that in this normal health standard the formation of uric acid is in the proportion of thirty-five to one ot urea. But that certain dietetic substances, medicines, habits or diseases have the power of checking, not the formation, but the excretion of uric acid.

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*Read before the Tennessee State Dental Society, 1914

DeLong asks, if uric acid is the great toxin that is claimed for it, how does it do its baneful work?

The entire principle of nutrition and excretion as well, depends for its normal working on the uniformity of arterial tension, and free and unobstructed capillary circulation.

Oxygen taken in during inspiration, in quantities howsoever generous, is of no value as a conserver of life, only so far as its inhibition is followed by uniform distribution to the nearest and most distant individual tissue cells. Therefore, any impediment to the normal capillary ebb and flow must be attended with more or less serious results. The greatest harm to the tissues from an excess of uric acid seems to rest on its peculiar power of disturbing this peripheral circulation.

Haig claims that uric acid causes contraction of the arterioles, and by virtue of this contraction becomes the prime factor in the pathological changes in every tissue and organ of the body. He sums up in one of his brilliant theses on this subject as follows:

> If my premises are good and my deductions sound and if uric acid really influences the circulation to the extent I have been led to believe it does, it follows that uric acid really dominates the function, nutrition and structure of the human body to an extent which has never been dreamed of in our philosophy, and it may really direct the development, life-history and final decay and dissolution of every tissue, from the most important nerve center and most active gland to the matrix of the nails and the structure of the skin and hair.

This is, to say the least of it, a most startling declaration.

The function of the kidneys is to filter and remove from the blood certain deleterious and waste products, among which is uric acid and its salts. These products can be removed in this manner, however, only when in solution.

DeLong says uric acid is extremely insoluble in a fluid at a low temperature and of acid reaction, but freely so in an alkaline medium.

Under these conditions it is quite easy to understand why all substances which form soluble compounds with uric acid, or increase its solubility in the blood, should increase its excretion, and why all substances which form insoluble compounds with it and diminish its solubility in the blood should lessen its excretion. It is, therefore, the chemical reaction of this great life-giving blood stream that hastens or retards the elimination of this most abundant poisonous waste material. If the blood is of normal alkalinity, uric acid and its salts are easily held in solution and promptly eliminated through the kidneys. If there is a hyper-acidity of the blood, the saliva and the product from other excretory glands will have a corresponding acid reaction and these become surcharged with uric acid and lime salts, which may, by a process of metastasis, be deposited by slow accretions around the joints, as arthritis, in the urinary and gall bladder, as kidney or gall stones, and on the necks of the teeth, as tartar, and in many other ways this poisonous waste, in its efforts to eliminate itself from the system, percolates through connective tissues and muscular fiber, contracts the arterioles, dams up the capillaries, producing the anemic and cadaverous complexion of Bright's disease, reacting on the heart action, resulting in valvular lesions or endocarditis.

But it is in our power to facilitate the excretion of uric acid by controlling the acid tendency of the blood, indirectly, by reducing the quantity of uric acid introduced into the system with the food. To this end all stimulating drinks and nitrogenous foods should be avoided; a diet of milk, eggs, fruit, an occasional fish dinner, and bread; should be adhered to. As remedial agents the salts of sodium and lithium have for a long time been the principal alkaline treatment relied upon. Purgatives and laxatives are employed as occasion demands. Owing to the large amount of salt—an alkali—inhaled into the lungs and absorbed through the pores of the skin, the blood of the seafaring man is preserved in its normal state of alkalinity, uric acid and its salts are easily held in solution and promptly eliminated through the kidneys, and he is happily immune to all that long list of diseases whose prime source is in the acid tendency of the blood and not from the so-called metastatic infection from a case of pyorrhea alveolaris.

Now, my friends, in the *Dental Review* for April, there is an able paper on "Autogenous Vaccines," by Dr. Schumann, of Chicago, which was freely discussed by Drs. Johnson, Brophy, Carpenter, Reid, Kester, Hinkins, Wooley, Davis and Roach. All these able men concurred in the opinion that autogenous vaccine was the coming treatment for pyorrhea—that is, after our experts had studied it long enough to learn more about it. They tell us that salivary or serumal calculi is the *original* cause of this disease; that this cause must first be thoroughly removed, and even then, Dr. Schumann says, I believe, with Drs. Johnson and Brophy, that it is far from having been proved that these vaccines will bring about a cure without other treatment. They fail to tell us the composition of this tartar and where it comes from. They fail to tell us that when this original cause has been removed and the parts placed at rest that nature will complete the cure, provided the blood is restored to its normal alkalinity.

Toward the close of his article, Dr. Schumann tells us that the removal of the cause of pyorrhea probably will bring about a cure in all instances, if it could be removed entirely; but he says, I have never yet seen a case where it has been removed by local manipulation.

If this is his final analysis, then the logical thing for him to do would be to extract all the teeth, supply a full set of false ones for all his patients afflicted with this disease.

Nearly fifty years ago, in extreme cases of this disease, I extracted thirty-two teeth in thirty-two seconds without an anesthetic, ordered phenol sodique held in the mouth five minutes at a time night and morning and in three weeks found no suppurating pericemental membrane, no necrotic margins of the alveolus, no pyorrhea pockets for the proliferation of infectious germs, but the gums perfectly healed. In that day this was considered the most expert local manipulative procedure for the removal of this original cause of a disease which was then considered incurable by any other method. Someone has said that pyorrhea is the local manifestation of a constitutional disease.

After all the teeth have been extracted in an old chronic case of pyorrhea, and those local manifestations have all disappeared, leaving the entire mucous membrane of the mouth in a perfect state of health, what will become of those constitutional diseases which are associated with rheumatism and the arthritic diatheses, that are said to have been produced by metastatic mouth infection? Will they disappear as quickly and as completely as the local manifestations did—even if the vaccine treatment has been used? I say, "No!" most emphatically, unless this autogenous vaccine will neutralize all traces of acid in the blood stream, and restore its normal alkalinity and maintain that condition.

In the *Dental Digest* for March is an article from Spencer Davis, M.D. After speaking of food particles left about the necks of the teeth, he says:

> When this food becomes decomposed by the bacteria of the mouth, the saliva becomes altered in its reaction, tartar becomes precipitated from it and finding the stagnant areas between the teeth and gingival margin a favorable location, it becomes deposited there. As soon as this deposit becomes large enough to cause pressure on the soft tissues, the pus-producing organism finds a suitable soil upon which to grow, and pyorrhea results.
>
> From this focus of infection bacteria may make their way into the blood stream and become deposited in the joints, producing a true joint abscess. In such a case microscopical examination of the pus drawn from the joint shows the same bacteria as that in the pus pocket of the gums.

He further says:

> We look upon all joint infection as always being secondary to bacteria in the body, and rheumatism no longer exists as a disease; that pyorrhea can produce the so-called rheumatism is now well recognized, and the dentist is frequently called on to clear up this focus of infection.

We never know how little the average M.D. knows about dentistry until he begins to write about oral sepsis.

I say that the decomposition of food particles remaining about the teeth and gum margins does not cause the saliva to become altered in its reaction. The saliva is surcharged with urates and lime phosphates before it enters the mouth and these waste products are precipitated on coming in contact with the mucus and other mouth fluids and are deposited, not "in the stagnant areas between the teeth and the gingival margins," but on the surfaces of the teeth, and these accretions extend deeper on the necks of the teeth so as to impinge upon the peridental membrane and the abutting gum margins, these succumb to irritation, inflammation and suppuration, resulting in that growing evil, pyorrhea. I say that the deposit of tartar on the teeth is not the original cause, but the exciting cause of pyorrhea. Its prime origin begins with too much acid in the blood. I say that rheumatism is as much a disease today as it was five hundred years ago. I deny the assumption that it is now a well recognized fact that pyorrhea in the human mouth may become so malignant a foci of infection that by a process of metastasis through the blood streams pus-producing germs may be deposited in the joints, producing a true joint abscess or empyema of the anthrum, a suppurating appendix, a carbuncle on the neck, or a suppurating lymphatic gland. A patient may be afflicted with all these Job's comforters in quick succession, and in all of them you will find the streptococci and the staphylococci, the same pus-producing germs that are found in the pus pockets in the mouth; but I deny that this fact proves that the mouth is the foci of infection, that by some metastatic or acrobatic action it does or can infect all these distant organs and tissues, but I claim that all these and the mouth infection also, are the result of imperfect or improper elimination of uric acid and its salts—owing to the over-acidity of the blood.

In your experiments for the cure of pyorrhea with autogenous vaccines, remember that it is not a specific disease, that it has no specific germ, but search for something that will restore the blood to its normal state of alkalinity, and if you succeed, you can render the patient immune to all diseases produced by the arthritic diathesis, or by a disturbed process of nutrition.

DISCUSSION

DR. J. P. CORLEY: I am really not capable of discussing this paper, and I would not presume to take up the time of this scientific body with the comments I could offer.

I want to commend most heartily the work of the essayist. I am ashamed of the fact that more of us do not get down and grind out the grist like this. I really do not know why we do not do it. I guess we are too busy extracting teeth, perhaps, or something like that. If we had more Mewborns we would not need to have so many Corleys. A paper of this kind, in my opinion, should not be discussed unless it can be done learnedly and scientifically, and I confess to you with shame that I am really not capable of discussing it.

DR. L. G. NOEL: I did not come in time to hear more than the closing part of the paper. Therefore I am sure I could not do it justice, but I heard enough of it to make me thoroughly aware of the fact that it is a valuable paper, such as we always have from Mewborn source, and I regret that I did not hear it all.

Whilst I am not a bacteriologist and not a surgeon, and perhaps am not in a position to speak authoritatively about that, I must call the essayist's attention to the fact that such men as Billings, Mayo, and other surgeons and bacteriologists of note are pronouncing the doctrine now that rheumatism does come from foci of infection in the mouth. These pus germs may live in the blood streams under certain conditions of very lowered vitality; we may have septicemia, where we may have numerous micro-organisms living in the blood streams, multiplying in the blood streams, and producing a disease known as septicemia, so that I should hesitate to make denial that abscesses in the joints may not occur as a result of abscesses in the mouth, and may occur anywhere in the body.

I had the pleasure of hearing the celebrated interne, Dr. Billings, who lectured for the Academy of Medicine at Nashville, two years ago, and he had a great deal to say about rheumatism as coming from infection in the oral cavity, and from abscesses of the tonsils, which he said generally came from the infection around the teeth and other points in the mouth.

I am inclined to think that Mayo's views are generally accepted. I know he stands at the head of the profession now as an interne and surgeon.

Dr. Gardner: I don't feel competent to discuss the paper. I believe that that paper is one of the most scientific I have ever heard before the dental association. In order to discuss it intelligently it would be necessary for one to have the paper in advance, and do quite a bit of digging, and he would have to be a pathologist, bacteriologist, blood specialist, and a few other things connected with oral surgery. I enjoyed the paper immensely.

Dr. W. H. Richards: As to the conditions necessary for uric acid, and the products of uric acid, my friends, I stand before you as a man who has never had any wisdom teeth, so there is room for me to learn something. I have never had the evidence of tonsils in my life; I have no rheumatism.

About the time I was seventeen years old I took myself out behind the barn and had a conversation with myself, and I talked out loud to myself. I said, "Look here, boy, are you going to do like those old fellows around the hotel here, drinking coffee, all you can, and whiskey in proportion, and chewing tobacco and doing everything else that would tend to weaken a man?" I said, "No, William Hennery, we will cut those things out, so that when we get to be an old man we can stand up to three meals a day and fill our pocket book."

I set aside for myself a strict regime—no coffee, no tea, no tobacco, no whiskey, no coca-cola; as I say "no coca-cola," I think I did not include that as one of the trinity; there are three on the evil side: coca-cola, tobacco and whiskey. Notwithstanding the regime, I have had four attacks of uric acid, which have manifested themselves unmistakably. Thirty years ago I went to Tate Springs, owing to physical depression, stayed there all summer, and came away in September, and I was for two weeks passing from the kidney to the bladder a uric acid deposit—just like to have used William up for those two weeks; never had such a vaudeville in all my life. I have had no manifestations of this in any other way than the deposit within the kidney of this stone. I set about and had an analysis made to see just exactly what I was up against, and it was pronounced uric acid—uric acid deposit. At that time one of the brethren said: "Well, I think possibly you might have to lose that kidney"—that was on the right side. I haven't heard from that kidney since, and that was thirty years ago.

About fifteen years ago it began on the left side. I enjoyed a pain there that almost put me out of business for years and years, and my physicians, under examination, said, "It is posture pain, my dear boy; posture pain from stooping over the chair." Posture pain possibly had something to do with cramping the kidney and limiting its ability to do the work. I had no posture pain on the right side. I don't know how they managed that, you know, except one that came there when I was stooping. I had this pain for five long years, and ten years ago I passed another stone from the left side. I had that analyzed and the same thing was found. I had an X-ray made, and went to Baltimore, and the best stomach specialist there studied the situation closely.

About three years ago I had another attack on the left side. It put me out of business for a while, and the examination showed the same thing.

Now, gentlemen, with these evidences of uric acid, which are marked, and which kept me going when they were active. Just three years ago the surgeon said, "Richards, you are apt to have uremic poison-pus, resulting from the accumulation in this kidney," and the surgeon came in with an attractive looking expression. I said to my doctor, "If you don't stand between me and this knife I will give you up. No knife in this fellow. If I had taken the advice of the knife man thirty years ago I would not have had this one, and what would have become of William?" He said, "We will stand with you and see what can be done." We took up a treatment, eliminating the pus and cleared up the situation. That has been three years ago. I have not had any return of that in the last three years. I am here today without any evidences at all along the line referred to, nor have I had, so far as my joints are concerned, any evidence of rheumatism, and my mode of living, from the health standpoint, is within the lines from which you would expect naturally these conditions not to occur.

I hold that I am a living example of uric acid conditions without the symptoms that naturally come along these lines. So far as my teeth are concerned, they are perfectly sound, I have them all, nearly; I have not had any pyorrhea, or evidences of it, and so far as diseases are concerned, with the exception of this thing that we call uric acid condition, that is the only thing I have. I am here now with as steady a hand as anybody has, and if I live a little while longer I will be an old man.

DR. MEWBORN (closing): In closing the discussion of this paper, I shall have but little more to say. We have here a living witness in Doctor Richards, whose graphic description of the evidences of well marked uremic poisoning and his occasional suffering for thirty years. This insufficient action of the kidneys was not caused by pyorrhea as a foci of infection, nor the precipitation of uric acid and urate of soda by an abscessed tooth, because his teeth and gums were perfectly healthy. No doubt there are hundreds of similar cases.

It is very distasteful to me as a dentist to have the medical world jumping on us charging that our poor work in the mouth is the cause of many diseases which they cannot account for in any other way. I cannot swallow that from anybody—I do not believe it. It is not unreasonable to say that septic conditions of the mouth and a great many other distant localized septic conditions may originate from a common source; say, in the laboratory of the liver. It is now well known that after the gastric juice has converted a piece of beef steak into peptones it is necessary that somewhere in the body these peptones be converted into animal acids and some of them finally into urea. This work the liver has to do. Who is willing to deny that under certain conditions, this action of the liver may not produce an acid reaction of the blood? In that "twilight zone" between the terminals of the arteries and the veins, where the afferent and efferent capillaries meet; where the one deposits its supply of nutrient matter for the formation of living cells and the other takes up the waste materials to be eliminated from the blood stream—this is metabolism. Too much acid in the blood renders it incapable of holding waste and other poisonous matters in solution for normal elimination. If this is not done these urates must float in the blood stream until deposited as gall stones, kidney stones or tartar on the teeth. The extra labor on the heart and arteries necessary to pump the blood through these contracted arterioles and damned up capillaries produces sclerosis of the arteries and valvular lesions of the heart. Bright's disease usually terminates suddenly in heart failure.

I believe the final solution will be to find a constitutional remedy that will neutralize this acidity of the blood and restore its normal alkalinity. I believe this will be done. I believe that remedy is already known. I could say more on that line if it were prudent to do so. I am holding back a part of this paper, therefore cannot fully come out with it now, but hope to develop it later.

CAVITY PREPARATION*

BY DR. THOS. P. HINMAN, ATLANTA, GEORGIA

IN CAVITY PREPARATION there are several considerations that must precede any movements or any work on the cavity. There must be a consideration of the occlusal stresses, and it is there many of us fail. We do not realize what stresses will be brought to bear, that will tend to dislodge the filling. There must be a *convenience form*, a *resistant form* and a *retention form*, as well as other considerations. These are essential. I do not believe any one can prepare a cavity who does not have some imagination. You must look at the tooth, and imagine how the cavity should look in its final preparation. I have seen many young operators take a bur, and then a chisel, and accomplish nothing, because they had no imagination. You cannot be a dentist without imagination. When you see a cavity, you must know what kind of cavity preparation will be most satisfactory, remembering we must have convenience, resistance and retention. Another point, that all anchorages should be in the crown or in the occlusal surfaces. The trimming of the marginal enamel is a very important thing. You cannot produce a well formed and satisfactory cavity unless the enamel at the cavo-surface angle is trimmed away, because the stress and force of mastication comes down upon the filling with such a degree of power and stress, ranging from 75 to 300 pounds, that it fractures the short enamel rods, unless the filling is allowed to lap the margins. It is the same with inlays as in filling with gold foil. According to my judgment and practice, the first thing I should establish in a cavity is cavity outline. I do not drill a little hole, and then take my instruments and fool around there. The first thing is to make up your mind absolutely as to what shall be the outline, and establish it. The rest is an after consideration so far as the cavity preparation is concerned. Remember that the floors of the cavity must be flat; otherwise you do not get the resistance form. If you do not make them flat, you have what I yesterday called a "toboggan slide." A gentleman yesterday stated that it didn't seem that I carried the cavity outline a sufficient distance. All things must be done with judgment, and it is absurd, where you have a cavity, and one of the fissures has no signs of decay, and the union of enamel is perfect, to cut out those fissures. But if there is any showing of disintegration, it is bad practice not to cut the fissures out. No enamel should be left standing that is not supported by healthy dentine. That is a principle that must be followed throughout in cavity preparation. Do not try to dig in under and get out the dentine, and put in some sort of a filling and expect permanency.

A MEMBER: Do you make any undercuts?

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*Second lecture Post-Graduate Course, Kentucky State Dental Society.

DR. HINMAN: No undercuts are made in the axial walls at the dento-enamel juncture, because there is no logical or physical reason why they should be made. If we did, we might cut away from the enamel the very support Nature put in there, and the occlusal stress would break off the rods, and we would have a place for redecay. In what directions are the stresses of mastication? Vertical and rotary. Don't cut away the occlusal surface any more than is necessary, because that means the cutting away of good tooth structure. I am going to show you some complex cavities, distal, occlusal and mesial. One shown here is the M.O.D. cavity, mesial, occlusal, distal. I will make the statement that no one has ever been able, without reinforcement, to cast an inlay to fit, even moderately well, a cavity of this description. I have never yet seen a cast inlay made from a direct impression made in wax and carved up and cast, that ever fitted the cavity. I do not believe it can be done. We jumped into this inlay proposition because we thought it an easy way. It is, instead, very difficult, and not an easy manner of filling teeth. There are many considerations in connection with it, and it is impossible for any one to make a wax impression direct and cast an M.O.D. inlay. Dr. Price took a metallic tungsten bar, and made a staple, and put it in the wax, and then cast it, and he got a moderately good fit.

In an inlay you must take into consideration many things. The making of a wax model of cavity, especially the M.O.D., is a practical impossibility in the mouth. How do we know that the wax is down? How do you know that in the manipulation you haven't pulled it away from the margin? How do you know it is not away from one place and flush with the other? And yet we go ahead and take an impression and cast an inlay, and it never goes in. I have never yet seen an inlay cast for a simple occlusal fissure cavity in a molar that went down into place absolutely. Start out with the wax. It is liable to distortion. Start out with the investment, and note the possible change that takes place. You must not invest your inlays tonight, and cast them tomorrow. The heat should be applied to your investment within one hour after the investment is made. (I have adopted a method whereby, after the inlay is cast, I correct it, and I will show that later). After the heat has been applied, and the wax has been burned out, you can lay it aside. In the casting of an inlay, I believe the most successful work is done by first making your investment, and then in 20 minutes, say, begin heating it, and then when it is burned out let it cool, and then carry the process through.

A MEMBER: Isn't it better to get it burned out as soon as possible?

DR. HINMAN: Just so it is within the first hour. With incisors, the cavity preparation must be along similar lines. The points of recurrence are three, mesio-lingual, labio-lingual angles and the point of proximal contact. The more frequent recurrences are at the lingual angles. Sometimes in cavity preparation it is not as necessary to go as far toward the labial side, but only far enough forward so that we can get the reasonably convenient form. The cavity must be extended to a point of immunity. Each tooth, of course, must be considered as a unit in relation to the whole. Why is it unnecessary to put in large undercuts or forms of retention? For the simple reason that the stress of mastication and the force that tends to dislodge the filling are so light that it is unnecessary to make extensive undercuts in the incisors for their retention. I believe for marginal work the round bur has no place at all. Unless the cavity is carried to the area of immunity, neither inlay nor gold nor anything else will take care of it. Very often, when the enamel has been badly undermined in an incisor, we have said to our patients, "I will leave that point, if you will take a chance on it." They say, "Yes," and it rarely fails but that they come back a little later, because of broken-down enamel and we have further decomposition. Some patients will say, "Dr. So and So has said that my teeth are too soft to hold gold." Of all the absurdities ever spoken, that is the most absurd. It is just a question of proper care in cavity preparation and filling.

How many times have you found that after filling a tooth the pulp would be irritated, and would sometimes die, and you didn't know why it occurred? It occurs sometimes because the bacteria in the tubuli are of such a character, they pass into the pulp and cause the trouble. If we better understood the relation of one tooth to another, the relation of a tooth to its fellow, we would be more appreciative of a correct anatomical occlusion.

THE BUSINESS SAVING SIDE OF DENTISTRY*

BY A. F. LINSCOTT, D.D.S., MARION, OHIO

EVERY JOURNAL THAT WE PICK UP tells us about the business side of dentistry, but none has ever pointed out this particular side, except from a point of getting better fees for services, and making incomes compare with the less dignified professions, as plumbing, bricklaying, paper-hanging, and the like.

The object of this article is to draw attention of the dental profession not only to the building of this income, but the saving of it after it has been secured. There are many things which might be chosen to illustrate this point, but I have, in the face of the recent advance in a much used article, chosen—mercury.

For many years the dental profession has bought the best grades of mercury for a dollar and fifty cents per pound. The fact that the European war has been given as the sole cause for the great advance in the price of mercury has prompted the writer to give the subject some study and solve the problem of preventing a mercury famine, as claimed by some. The writer has thus far failed to see wherein the war has had anything to do with this most necessary necessity, and after the dentist reads this article he can answer the question for himself.

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*Clinic at Ohio State Dental Society, 1914.

Statistics tell us that California produces the great bulk of the mercury of commerce and most of it comes from the New Almaden mine. The total produce of California was 60,851 flasks (of 76½ pounds each) in 1881; in 1908 it was 16,984 flasks (of 75 pounds each), valued at $684,716. In 1910 the total output of the United States was 1,545,000 pounds, chiefly from California; but Oregon, Nevada and Texas also yield small quantities. Mercury also occurs in Spain, Austria, Italy, Russia and Mexico. During the year 1910 the United States exported 467,434 pounds of quicksilver, valued at $256,084. The above statements would not leave the impression upon one that there was a scarcity of mercury in the United States, and it won't be long until the "Made in U. S. A." will be stamped on every bottle.

The writer uses and wastes about three pounds of mercury each year; some use more and some use less. In order to gather figures for my clinic I have measured the other dentists in the United States by myself. We have about 43,000 dentists in the United States, and if each uses three pounds of mercury each year, that would be 129,000 pounds for the entire profession, at $1.50, would be $193,000 annually. This amount must be divided into three parts in order to see what the profession is actually throwing away each year, and here comes in the business side of dentistry. All dentists mixing amalgam for a filling invariably mix more than they will use for that particular filling and a portion is left, which is more often destroyed than saved, and when saved for any length of time, some fellow will drop in and beat him out of it, and in this manner he realizes little or nothing for his trouble. This can be called the first third lost. The excess mercury used in the mix which is extracted by the chamois skin, and is nearly always thrown away is the second third of the whole, and the remaining third can be reckoned as that which goes in the patients' mouths. This last third is paid for by patients, but the other two-thirds can be reckoned as waste and thrown away, which in dollars to the profession, would be $129,000. An enormous advance in the price of this necessity of dentistry would make the figures too large for the ordinary dentist to enumerate.

The barometers of the times can be called living barometers in the form of men who frequent your office and mine, in search of our old amalgams, who carry them home and remove the mercury and sell the recovered products to the dentist at advanced figures. The object of this clinic is to show the dentist how he may do these same things in his office and thus pad his purse and shut out a great number of these middle men.

The retort which is used is made from a two-inch nipple, four inches long (secured at the plumber's) on each end of which is fitted a nipple-cap. The portion of the retort used as a bottom, the cap, must be secured by threads, so it will not open and makes a one-piece jar. The top cap is perforated by a three-eighths' inch hole, into which is fitted a coupling and an elbow, and to this ell is connected three feet of quarter-inch pipe connecting a second ell, and a quarter-inch down-spout eighteen inches long completes the retort.

Mercury has an atomic weight of 200 and a specific gravity of 13.6, remarkable as being the only metal that is fluid at ordinary temperatures. At 662 degrees it boils and forms a colorless vapor of specific gravity 6.967. It is a fair conductor of heat and electricity and has a regular coefficient of expansion.

Place in the retort from two to three pounds of the old amalgam and apply the heat until the retort is brought to the required temperature, or about a cherry red, at which time the mercury will volatilize and pass as a gas through the pipe. When it reaches the second curve of the pipe, which is cooled by allowing water to drop upon it, the mercury deposits at this point in its metallic state and by a tap upon the pipe releases itself and flows into the vessel, which should be a bottle with the nose slipped over the outlet of the pipe. It is well to mention, at this point, that the operator should use care, as the fumes from the mercury are very poisonous and should not be inhaled. The mercury obtained may then be transferred to a vessel and treated with pure sulfuric acid. The fine particles of metal carried over with the gas will be dissolved and you will have "redistilled mercury," as sold by the supply man.

The residue left in the retort should not be thrown away, as different makes of alloy contain a given amount of silver which is also valuable. Dissolve the metal which is left after extracting the mercury in nitric acid and a solution of nitrate of silver is obtained. By adding sodium chloride a precipitate of silver chloride is thrown down. After carefully washing the chloride with water, then with ammonia, and again with water and filter and dry, it is ready for the crucible. By heating this mass (to 1904 degrees) you may pour off the silver into ingots and you have extracted the valuable ingredients of your waste alloy.

I commend the above to the profession and while you are thinking of making money, think of the leaks in your business which are taking your profits and winding you up at the end of each year in the same annual stopping place. "Take care of the dimes and the dollars will take care of themselves."

You may drive a mule to water,
But you cannot make it drink;
You may send a fool to college,
But you cannot make it think.

A CONTRIBUTION TO THE TOOTH IN ITS RELATION TO FORENSIC MEDICINE

BY HERMANN PRINZ, A.M., D.D.S., M.D. PHILADELPHIA, PA.

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS, DENTAL SCHOOL, UNIVERSITY OF PENNSYLVANIA

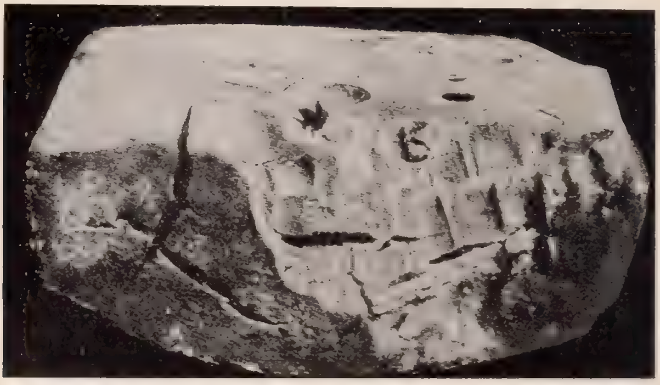
HUMAN TEETH HAVE FREQUENTLY served as important factors in the detection of criminals. A piece of cheese, an apple, or some other article of food in which the culprit had bitten at the time of committing the deed and which was carelessly left at the scene of the crime has often furnished valuable clues to the criminologist. A plaster of Paris cast is usually made of the imprints of the teeth left in these objects and in many cases a defect, an irregularity, or some other peculiarity is observed which may aid in the identification of the criminal. The following instances furnish instructive illustrations. A banker was murdered in his private apartments in St. Petersburg. No robbery was committed and apparently no clue could be obtained to assist in locating the culprit. Lying near the body was found a cigar holder which had a mouth piece made of amber. This mouth piece showed a peculiarly worn tip which apparently resulted from the sharp edges of the teeth. During the trial, the judge observed in the mouth of a witness (a cousin of the deceased and his apparent heir) a peculiar deformity of the teeth which reminded him at once of the worn tip of the cigar holder. Confronted with the *corpus delicti*, which upon trial exactly fitted into the dental deformity, the cousin gave himself up as the murderer.

Some ten years ago a robbery was committed in a suburb of a German city. The hungry culprit obtained a piece of Swiss cheese at the premises, of which he took a goodly bite. Apparently the quality of the cheese did not comply with the taste of this connoiseur, and when he made his French departure, he left the piece on the window sill. The cheese remnant was taken to the police station and a plaster cast was made of it, showing typical abrasions of the teeth on the left side of the jaws, which possibly were the result of the constant use of a pipe. A "round-up" at the dives of the gum-shoe fraternity of the city was immediately ordered and the "cheese-toothed" culprit was easily located among the caught "gang." The accompanying photograph shows a picture of this cast.

Again, the teeth have often served as the only means in the identification of the dead. At present, it is customary with dentists to keep charts on which are pictured all the teeth in their anatomical relationship; their various defects are marked on this chart, i.e., filled or crowned teeth, missing teeth, artificial substitutes, etc., and thereby a perfect record of the dental organs of the respective patient is obtained. To illustrate the eminent value of these charts from a forensic point of view, the following cases are selected at random from current literature:

In the terrible catastrophe which destroyed the "Bazar de la Charite" in Paris, by fire, on May 4, 1897, 126 people were burned to death within less than ten minutes. Many of the most distinguished people of Paris were among the victims. About thirty of these unfortunates were burned beyond recognition and it was only through the solicitation of the aid of the various Paris dentists that most of the charred bodies were recognized by their teeth. As the teeth are much more resistant to fire and decomposition than any other part of the human body, the dentists were able to examine them and compare them with their charts and thereby absolutely identify many corpses.

The Imperial Prince, Napoleon IV., was killed on June 7, 1879, by the Zulus, in Natal. The body was terribly mutilated and among other wounds inflicted by seventeen assagais (Zulu spears), an ear was cut away and the cheeks were perforated. On arrival of the body in England on July 10, 1879, decomposition had so far progressed that recognition was impossible. It was only by the aid of the former dentists of the Imperial Prince that perfect identification of the corpse was accomplished without a doubt.



Plaster of Paris cast of a piece of Swiss cheese, showing impressions of human teeth.

After the assassination of President Lincoln, John Wilkes Booth took refuge in a barn, situated on a farm in Virginia, across the Potomac. The United States Cavalry pursued, surrounded the barn and fired it. Booth burst forth and attempted to escape, but a sergeant shot and, as was supposed, killed him. It became a serious question as to whether Booth had been killed. Many claimed he had escaped and was living in foreign parts under an assumed name. This dispute continued for years. Shortly before the death of Edwin Booth, the celebrated actor, permission was granted to remove the remains of the supposed John Wilkes Booth to the family burial ground in Druid Hill Cemetery, Baltimore. Of course, the family could not identify the remains. The family dentist who had treated the Booth family for years was brought specially for the purpose of examining the teeth. He at once identified the body by a certain filling that he had inserted in one of Booth's teeth, and also a striking peculiar formation of the jaw that had impressed him at the time of the operation. This identification was positive, and settled the fact that Booth had been shot.

One of the most interesting cases in forensic medicine from the dental point of view is the Webster-Parkman trial, which occurred in Boston. A detailed report of this case is found in the American System of Dentistry, and the following brief resume is culled from Rehfuss' Dental Jurisprudence: On November 24, 1849, Dr. George Parkman, a wealthy and well-known resident, disappeared. He had been last seen at the medical college of Harvard University, in the company of the professor of chemistry, Dr. John W. Webster. A week after his disappearance, portions of human remains were found in a vault in Dr. Webster's laboratory; other parts were found in a tea chest, while in a furnace were also found pieces of human bones. Among the ashes about one hundred and seventy grains of gold were discovered; also, a lower tooth, with a cavity in it, once filled by a dental operation, three blocks of mineral teeth with rivets, but without the gold plates, and a great many fragments of bone belonging to the skull and lower jaw. The bones and teeth appeared to have been exposed to intense heat. Under ordinary medical experts, identification of these mutilated remains with that degree of certainty required by the criminal laws was impractical. One Dr. Keep not only identified the burned and mutilated jaw and teeth as those of Dr. Parkman in a manner which amounted to a demonstration, but also, from the melting and chemical effects produced, was enabled to say what had been the means employed to produce the partial destruction. The remains thus being identified, other evidence pointed so conclusively to Prof. Webster as the murderer, that on the eleventh day of the trial a verdict of guilty was reached by the jury. Dr. Webster eventually confessed this crime. His confession in a remarkable degree verified the particulars given by the dental expert.

The dentist may occasionally be called upon to furnish expert testimony regarding the nature of the implement which has inflicted certain wounds, i.e., whether the wound is caused by a human tooth, an animal's tooth, or a tool. The following case culled from Hoffmann's Legal Medicine, is of interest in this respect: The body of a young girl, exhibiting many injuries which apparently were inflicted by a dull-edged tool, was found near a building under construction. The first conception of a hasty examination of the body seemed to indicate that murder was committed. A post-mortem examination, however, revealed certain wounds which, in all probability, were caused by the teeth of some ferocious animal. Witnesses testified to the fact that they had heard on the evening prior to finding the body, cries for help, and the howling of a dog. During the trial, it was learned that the builder had left the premises for protection in charge of a watch dog, which had killed the girl, as was proven by dental expert testimony.

Some time ago the writer was consulted about his opinion regarding two porcelain teeth which had been picked from the ashes of one of his former patients, who had been cremated. The family was not aware of the presence of these teeth during the life of the deceased, hence they doubted the genuineness of the ashes. A careful inquiry revealed the fact that the ashes represented the genuine remains of the person under consideration, but the two teeth did not belong to him during his life and they had become accidentally mixed with his ashes after cremation.

The literature relating to the destruction by fire of dental organs and their adnexa, fillings, artificial dentures, etc., is somewhat meagre. To satisfy his own curiosity, the writer has carried out numerous tests in this respect, the results of which are herewith appended:

The following articles were placed in an iron ladle, as used in the dental laboratory, and exposed to an ordinary soft coal fire in a furnace for about one hour: Six pieces of amalgam, about ten years old (left overs from hand mixes as used in a dental office); one large piece of copper cement; one large piece of Ames' crown cement; one large piece of Alva cement; one large piece of Ascher's artificial enamel; ten human teeth, partially fresh extracted, partially old extracted teeth; a few teeth carrying amalgam fillings, one tooth having a gold filling and one a cement filling; one human molar having a large cast gold inlay; two pieces Roese's copper amalgam; one tooth with a Roese's copper amalgam filling; one Logan pin crown, platinum post; one Davis pin crown, German silver(?) post; one rubber denture carrying five porcelain teeth; one lower rubber denture with gold clasps and porcelain teeth; one aluminum denture with three porcelain teeth set in rubber; one new gold crown; one piece of clasp gold; one piece of gold rope (filling gold) rolled into a ball; one plate tooth with gold backing; one piece of dry bone, i.e., about one inch of a human femur; the left half of a fresh human mandible, partially covered by muscular tissue, carrying seven natural teeth.

The results of this test are as follows:

Rubber dentures are completely burned up, leaving no trace of the rubber.

Porcelain teeth, whether single or gum section teeth, having platinum or base metal pins, remain intact. Some of the teeth are slightly discolored.

Aluminum dentures are not completely burned up or melted; they are found to be heavily oxydized. Apparently this heavy coating prevented their being melted. The rubber attachments are completely burned off, but the porcelain teeth remain intact.

The various silver-tin-mercury amalgams, which also may have contained small quantities of copper, zinc and probably other metals, are completely volatilized, no trace of the alloys can be detected. Only the copper amalgam shows no visible change, the typical diamond shape of the amalgam is preserved. A large copper amalgam filling in a molar has preserved its shape and apparently is not altered.

The copper cement, Ames' cement, and the other oxy-phosphate cements do not show any visible change, except possibly being somewhat lighter in color; the color of the copper cement does not seem to be changed. Ascher's artificial enamel, a silicate cement, has frothed and swelled up, somewhat like ordinary borax will behave under the blowpipe.

Porcelain crowns, having either platinum or base metal pins, are not altered in the least. The piece of tin has melted on one of the crown pins.

The gold cast inlay is intact, no alteration of its shape is observed. The gold crown is twisted out of shape, the solder has burned out and the gold is completely covered by some heavy deposit (oxid?), which possibly prevented its melting. The piece of clasp gold (platinum gold alloy) is not altered in the least. The rope of gold is found unaltered, while the gold filling present in one tooth has fallen from the cavity and melted into a ball. The gold crown attached to a lower rubber denture has melted also into a ball, while the clasp metal of this plate cannot be found. Probably it has rolled away or become imbedded into the melted ladle iron. It should be here stated that the heat of the fire was rather severe, since a part of the iron ladle near its side and bottom has melted away.

In burning up of human teeth, usually it is found that the enamel cap completely separates from the dentine, the enamel assuming more or less a bluish-grey tint. The general outline of the teeth is always preserved, however; they are very frail, as their organic constituents are completely burned out. In most cases it is easy to make out their general shape, i.e., it is possible to tell whether the tooth is a molar, a canine, etc. Burned teeth, as stated above, are very frail and must be handled with great care. The gold filling present in one tooth, as we have said, has become dislodged and melted to a small globe, while the amalgam filling is completely volatilized, leaving a black deposit in the cavity. The cement filling has fallen out of the tooth, but it is not altered. The piece of dry femur bone is very light and friable, as the organic constituents are burned out, but its general shape is preserved. The half of the green mandible has also preserved its shape; it is very light and of a whitish color with slight reddish deposits about various places. The teeth in situ in this bone are also intact, but they fall readily from their sockets, some are broken near their necks. A piece of the mandible is broken off by accident.

To verify the results as obtained by the above procedure, most of the enumerated articles were subjected to the same test singly under approximately the same conditions. The results of these individual tests merely verified the original findings.

There is one quality the possession of which is the supreme need of the dentist, without which he is as unfit and useless as a tone-deaf musician or a color-blind painter; that is, the faculty of exact observation.—*Minot.*

NOVOCAIN, THE IDEAL ANESTHETIC*

BY J. CRIMEN ZEIDLER, D.D.S., NEW ORLEANS, LA.

WHILE AT OUR STATE MEETINGS the clinicians and essayists are so pressed for time, I am going to state my preferences to novocain-suprarenin over any other anesthetic in as short and concise form as I would deem practical, endeavoring throughout to avoid any superfluity, and for that reason should my article appear technical and brief, consider that the cause.

To begin, the greatest obstacle dentists have to contend with is the suspension and abolition of pain, and as this one cause has been the scion of the human race for centuries it does appear to me that this would appeal to most of us as a more than important study, and that the mere taking and using of what the pharmaceutical houses offer us without first giving same a deep study of our own, is today the chief factor of our failures.

I know personally of dentists who had in the past year attempted to use seven or more different solutions and forms of anesthetics, and at the end condemn them all. Today you must specialize. Study them all, then select one, and only one until such time arrives when you will be convinced of something better. Clinging to that rule, I have adopted novocain-suprarenin, and for the past three and a half years I have not deviated from its use and study. My success at first was partial, and in a few instances disheartening, but within a very short space of time I had mastered its use, and the time arrived when I used it without a single failure.

Let me first show my preferences and that of others to any other form of anesthetic presented to the dental practitioners today.

Novocain is sufficiently soluble in water, stable of solution, can be sterilized by boiling without deterioration.

Free from all traces of local irritation.

Wonderful compatibility with suprarenin.

It affects neither the respiration nor circulation when used in physiological doses.

Now, N_2O-O has been called the ideal anesthetic; you have heard it called that, but in what manner has it proven its idealism over novocain?

First—There is the difficulty of manipulation; you must watch the indicator, the bags and the patient, that is, provided you have not a sufficiently trained assistant, and you know as well as I do how many dentists can afford that kind.

Second -You must not rig your patient up with an apparatus that is in itself formidable looking.

*Read before the Louisiana State Dental Society, 1914.

Third—To the greater number of patients the inhalation of the gases is most obnoxious, causing any number of them to become dizzy, to vomit or to pass into deep anesthesia, which are undue interruptions. If we use it for deep anesthesia, the gag as well as the blood and saliva that accumulate obscures our field of operation.

Besides, in the majority of cases the monetary compensation for its administration, as N_2O-O is the most expensive form of analgesia we have.

Again, the technic is far too elaborate, and unworthy of further consideration from the dentist, in my humble way of thinking. Those are distinctly my views, and I have seen N_2O-O administered several hundred times, and in no instances was I as satisfied as I have been with Novocain.

Novocain, as you understand, exerts its influence by infiltration, and should you desire to follow the rules presented by several authorities, it is your liberty to do so; by that I mean the deep injection of the solution.

I have had my greatest successes by merely pricking the mucous membrane up as high as I would judge the apical end of the root to be, and bulging the membrane out like a toy balloon. This procedure is when I make my injections labially and buccally. In no instance do I attempt to operate on a tooth or extract same without making injections buccally or labially and lingually, injecting 1 cc. or thereabout minims labially or buccally, and the remaining cubic centimeters lingually. This is the technic when I use a 2% solution, containing 30 minims of distilled water. In anemic and tubercular patients I cut my solution down to 1%. The 1% solution I use exclusively on children when having to remove a deciduous tooth and live pulp.

The technic of the administration of novocain-suprarenin from beginning to end is very simple, and so simple that in some instances the simplicity of its use will cause some to become careless; by that I refer to the technic prior to the injection. Asepsis throughout should be your byword, to be maintained both within and without the mouth. I have an apparatus which is *office-made*, in which I keep my syringe. I have utilized a large cotton roll glass jar, filled three-quarters with absolute alcohol. Into the bottom of the jar I have dropped a small bag, *home-made*, in which I have sewed up annealed copper sulphate in white powder form. This chemical absorbs the water introduced into the alcohol from the atmosphere, and the syringe, and keeps it relatively anhydrous (about 99%) until the copper sulphate in the bag has resumed its natural blue color. In this jar I also have a copper disk with wide copper legs and a hole through center, through which the syringe is inserted, resting in the alcohol. As soon as the syringe is removed the alcohol evaporates, leaving the syringe aseptic through the bactericidal properties of the alcohol. My needle, which is kept in a similar preparation but in a test tube, is removed, the wire point drawn out, and screwed onto the syringe. In the meantime my assistant has boiled my solution out, and just as soon as it resumes about the temperature of the blood, I draw the solution into my syringe, expel the air, wrap end of needle in sterilized absorbent cotton until ready for use. The field of operation is then cleared by mopping freely with alcohol, and then painting surrounding tissues with iodine. Get the mechanical as well as the medicinal properties of iodine by rubbing rather briskly. The point of the needle is then passed over a flame before being inserted. The injection is then made and after a wait of from two to six minutes the tooth is ready to be operated upon in any manner you might deem fit—without pain—without the slightest bit of ill effects to your patient. The lasting power of the anesthetic varies from twenty minutes to one hour.

In mucous anesthesia the drug acts upon the peripheral nerve endings, while in conductive anesthesia the main trunk of the nerve supplying the teeth and tissues in the oral cavity is blocked or intercepted at a convenient point. I do not use conductive anesthesia entirely in the maxilla or mandible, only in extensive cases, and in those cases with a 2% solution and the proper technic I can remove from the third molar to the central incisor without pain. However, this form of injection is especially commendable when the mucous membrane is spongy, inflamed or presenting other pathological conditions.

For the extirpation of pulps in the anterior teeth I apply the mucous method, and in the remaining teeth unless I find that the rule does not work, then I use the conductive method. However, I will say this, that in most cases I have been successful in just using the mucous method.

After you have mastered the use of novocain-suprarenin, all other anesthetics, along with the many preparations for the devitalizing of pulps will be relegated to—well, to whatever place you are in the habit of sending useless things.

A talk with some patients upon whom novocain has been properly used would do more to influence its use than any form of arguments which I might offer; however, as this is not exactly possible, you are going to have to learn of your own accord, and that in itself will make you an ever greater enthusiast.

In summing up, let me again state my preferences of the superficial injection to the deep. When I formerly used the deep, I had patients complain of after pain, hemorrhages and syncope, but since I have discarded this form of injection, except in conductive anesthesia, where the amount is diminished, I have had no complaints whatever. Bear in mind the nature of absolute asepsis, discriminate, diagnosticate the condition of your patient, and your efforts will be crowned with success.

Discard adrenalin and the tablet form of novocain-suprarenin. Your causes for failure may be attributed to: Using deteriorated solutions; infected needle. To avoid this use all iridio-platinum needles and you will not be troubled with the accumulation of rust. Improper method of injection, insufficient dosage, and in contraindicated conditions. The boiling of your solution in any other than a porcelain or similar vessel is dangerous, especially if a teaspoon of inferior quality is used.

Before closing my paper let me inform you of what manner you can diagnosticate with novocain: If you suspect a case of obscure pulpitis or neuralgia you need but anesthetize it by the infiltration method, and if the pain stops your diagnosis is correct.

Again, let me sincerely recommend novocain-suprarenin for dental operations as well as for diagnosis. I am using it with unchanged success, and there is not a single reason in the world why all others cannot do likewise. My patients are most laudatory in their praises of it, and that I have earned their gratitude is in itself sufficient compensation.

ORAL PROPHYLAXIS THE GUARDIAN OF HEALTH*

BY JULES J. SARRAZIN, D.D.S., NEW ORLEANS

PROFESSOR MOUTH HYGIENE, ORAL PROPHYLAXIS, SPECIAL PATHOLOGY AND RIGGS' DISEASE TREATMENT

THE PATIENT'S CASE WAS FIRST DIAGNOSED as malaria, and later as typhoid. She had been confined to her bed about three months. There had been a chill one cold morning returning from a ball. Fever followed, which became intermittent in character; chills became periodical; all appetite and strength failed; she became emaciated; cachectic eruptions appeared on the body.

During the fall of the previous year a dentist had given her mouth many examinations on account of an impacted upper canine which he finally had another one locate by radiography, and which he successfully removed shortly before she became ill. The first physician who attended her made out the septicemia later, and diagnosed malignant endocarditis. Treatment thus directed afforded no relief. In fact, she was steadily losing vitality and resistance at the age of twenty-four.

Dr. Otto Lerch was called in. His usual thorough examination, the story of the case and its symptoms, convinced him that the cause of the septicemia must be found. Yet, there was no clear accounting for it. He listened to the impacted canine anecdote, and the fact that he is one of the few physicians who thoroughly appreciate the influence of mouth conditions on health, made him suspicious at once that the exodontia, which had required burring and lacerating, might have resulted in a wound which had become a focus of infection. I made a thorough examination of the mouth under the usual difficulties of attending patients in bed, this time increased by the fact that the patient could not bear sufficient light in her room, and lacked enough strength to maintain her jaws apart long enough to allow convenient probing. The exodontic wound was thoroughly healed, but slightly congested and tumefied gum margins reflected themselves in my mirror at the same time, while the remaining mucosa were anemic. The patient needing rest before she might again open her jaws, I kneeled on the floor to take the next opportunity to probe sockets around roots, but I felt quite sure that I was getting to the etiology of the case, and my posture was of no moment. I persuaded the patient to allow more light in her room while she protected her eyes with a handkerchief, and each socket probing revealed advanced Riggs' Disease, without wabbly teeth, and brought unmistakable traces of pus. The disease, although worse in some quarters than in others, was general throughout the mouth. It must have had its initial stages at least eighteen months prior, if not longer. They usually go unrecognized. Dentists never fail to diagnose Riggs' Disease when teeth wabble from a gust of air, and when only a few may still be saved. Strong systemic resistance saves the health of the robust patient, or it may be but slightly impaired, due to a constantly high opsonism. Between these two extremes we see manifested all grades of resistance and collapse.

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*Read before the Louisiana State Dental Society, 1914.

This girl was of a frail type. She had kept irregular and late hours throughout the Carnival season. The already infected blood current had predisposed the nervous system to the chill felt in the early morning of that cold night, returning from a ball. Office surgical treatment and proper home oral hygiene, practiced in time, would have prevented the dire developments, but their necessity had not been diagnosed in the incipient and early stages of Riggs' Disease. The majority of dentists do not realize that the slightest venous congestion of oral mucosa or tumefaction of gingival margins, anywhere in the mouth, approximally of any tooth neck, means danger, when not already a separation of subjacent peridental membranes, some frosty infectious deposits, decomposing serum, staphylococci and streptococci at least. Thus the patient had been confined to her bed. The infection had been allowed to vitiate the blood current in the diploe of the jaws, while ingesta spread it through the alimentary canal for absorption into general circulation, and she lacked the phagocytes and leukocytes necessary to wage a successful battle for her health.

Surgical treatment was out of the question for the present. It might be started later, as soon as the patient convalesced. Dr. Lerch directed his treatment to fortify the patient, while I prescribed, to be used four times a day and twice during the night; Vident polishing tape rubbed between the teeth against each one; a mouth wash containing tannin, iodin and potassium iodide; a narrow Vident brush, to allow convenient universal reach; Vident No. 4 Riggs' Disease powder*; and a Vident tongue

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*Vident No. 4 Riggs' Disease Powder:

Cuttlebone (inside spongy portion only, pulverized to No. 120 fineness)	℥IV
Pumice (No. 120 fine)	℥VIII
Soda Bicarb.	
Sodium Chlorid	aa ℥III
Acid Benzoic	ʒIII
Boric Acid.	
Zinc Sulphate	aa ℈ IV
Thymol.	
Carbolic Acid.	
Eucalyptol	aa gr. V
Flavor q.s.	

cleanser three times in twenty-four hours. I impressed the trained nurse with the enormous importance of reducing the quantity of oral septicism so that less of it would stagnate in sockets and enter the alimentary canal. My lady assistant showed the trained nurse how to effectively apply the above articles, how to stimulate gum circulation with brush bristles, and how to massage gingival tissue so as to help the return of venous blood to the heart. How little sick nurses know about the care of the mouth of their patients, and concerning its necessity, especially following some surgical operation on digestive organs, is appalling. With many nurses it is very difficult to have them follow such instructions even in part, because they do not realize their importance, and lack the desire to increase their own work. Their usual plan is to swab out the mouth when the patient asks for that service! How about the patient whose condition is aggravated by oral septicism, and who really requires much more than a perfunctory half strength H_2O_2 wet cotton wiping. Constantly, as patients under Riggs' Disease treatment, who have passed and recovered from the surgical stage of it, but require a close and careful maintenance of the prophylactic, must undergo some surgical operation or become ill, my lady assistant and I take special pains to train the sick nurse in charge of the case. The patient knows the importance of mouth hygiene and would readily submit to it, but the nurse usually neglects or omits it, with the result of actual damage and set back, showing in the mouth, to say nothing of the ingesta which will have delayed the patient's recovery, and actually endangered it when the surgical interference was in the alimentary tract.

The fundamental trouble is that all dentists do not teach proper mouth hygiene and its importance to all their patients, or else nurses would learn it somewhat; the next is that physicians, with a few exceptions, do not insist on the maintenance by nurses of favorable mouth conditions, because even they do not realize their full importance. Of course, mouth treatment for the sick room must be adapted from the usual home prophylaxis, with some modifications to suit conditions, and to make it acceptable to the patient without compromising results. In fact, patients become grateful for the mouth comfort given them, and will readily submit to it; those accustomed to its proper practice during health will ask for it, to be told by the nurse, in some instances, that she dislikes taking care of the mouth, and that is not her special business.

Fortunately the trained nurse in the case of septicemia under consideration was one of more than ordinary intelligence, who realized that since we depended on frequency of topical applications to dissolve pus with tannin, while iodin and potassium iodid exerted their germicidal and alterative actions, this treatment and its adjunct measures must be scrupulously enforced. She did so conscientiously.

Improvement in the patient's general condition began showing in the next forty-eight hours. Gradually, intervals grew between the periodic high fever spells, while more and more favorable symptoms developed, even to a reduction of the anorexia.

Dr. Otto Lerch had been delaying the start for his European vacation. Dr. A. E. Fossier, his associate, knew all the details in the case, and had also been attending it since the beginning. The patient's condition continued steadily to improve, but it must be expected to be a long and slow journey from an alarmingly dangerous condition to convalescence. However, the march in that direction was steady and seemed assured.

On my return, after attending the Kansas City meeting of the National Dental Association, my first office inquiry was about the young lady patient's condition. It was met by a funeral notice. I was dumbfounded. Getting in communication with Dr. Fossier revealed that just as I left New Orleans a previous engagement had called away the nurse on whom we depended, another sick nurse being called in to replace her. She was transmitted the training which had been given the first one by myself and my lady assistant, by our former explanations, demonstrations and reasons for thoroughness in the mouth treatment. Such transmissions of responsibility lack impressiveness enough to cause them to be thoroughly realized, even when they are conscientiously discharged and accepted. How much unintentional fault there may have been in any one of these factors, always remains a mystery. The crisis of the battle was on. The patient continued to improve by discouragingly slow strides. The question was how much longer the advantage could be kept on the side of phagocytes and leukocytes. Dr. Fossier, fearing that the mouth infection was not being reduced as well as precedingly, inquired into the matter, to be told that the patient's weakness did not always allow carrying out the full program. His perfect knowledge and realization of conditions made him remonstrate, of course.

Meanwhile, the proportion of infectious organisms had been increasing in the blood current, because their source of supply had grown. As long as measures had been effectively enforced to reduce the volume of mouth infection, the protective phagocytes and leukocytes had been in sufficient quantities to overpower and destroy the invading strepto- and staphylococci, constantly reducing their numbers in the blood, giving rise to a slow improvement, which was maintained for some time after thorough mouth treatment failed, because the defenders had by that time increased in sufficient hordes to repel and conquer a larger number of invaders. But, when the multitude of the latter became overpowering, all the resisting force had been exhausted; the cerebrum and then the cerebellum succumbed; death came almost suddenly. Its certificate was signed by Dr. Fossier for pyorrhea alveolaris as the primary cause of septicemia.

Robust constitutions are not exempt from fatal terminations caused by oral sepsis. The difference consists in a much longer period of resistance, during which the etiology of the systemic disturbances are so clouded that a diversity of chronic organic lesions are diagnosed, until the final crisis is reached, and at which time some more or less hypothetical cause is ascribed for death, without any realization of the fact that constantly increasing septicemia has been its determining factor. Usually, the etiology of the case has been cleared at no stage of it.

Some ten years ago the mouth of a robust fellow of 30 years showed me a clear Riggs' Disease condition. No teeth were wabbly, but many lacked normal firmness, and shallow proximal pockets were detectable on roots here and there. I warned, and treatment was started, but the patient's cerebro-spinal system was already affected both by septic ingesta and by frequent doses of alcohol which he constantly repeated because he was the owner of a barroom. He found it preferable to avoid a treatment which to him was a nervous strain and seemed severe, although, comparatively, it was not, due to the fact that his case was just somewhat past the incipient stage. A couple of years later he was back, brought by constant discomfort and occasional pain, the origin of which was in root sockets. There were generous pus pockets. Some roots were drifting out of normal position. A few molars were loose, but not yet shaky. He had developed Bright's disease, severe arthritis, migraines and occasional dizziness, unaccompanied by costiveness. He was more nervous than ever. Plainly, the cerebrum was becoming involved.

He was under the care of one of our leading physicians, who, however, did not attach the importance I did to the mouth condition. I tried my best to make the patient realize developments to be expected; the fact was made bare to him that if he would save both his health and his teeth he must submit now to protracted severe treatment, and effect half of the cure by his own efforts, or else, he had better at once lose most of his teeth and save his health. The only hopeful feature was that he had sold his barroom, used no more alcohol, and was under a proper Bright's kidney diet. This time he entered treatment, promising to submit to it and carry it out to a successful issue. In a few weeks his loose and uncomfortable molars had improved. He missed one appointment and then another, and finally stopped coming, just when a good start at changing mouth conditions had been made. I was well acquainted with him, and whenever meeting him seldom failed to repeat my warnings. From time to time he returned for the removal of one tooth or another which troubled him too greatly, but never to submit to proper treatment. He had become practically rid of Bright's disease, showing the possibilities of a strong constitution even under such adverse hygienic circumstances. But in the course of a few years he began to break down. His occasional dizziness, which never had ceased, increased. The digestive apparatus failed. Bright's disease recurred, with frequent arthritis of the legs. He just lived through alternate spells of illness and comparative invalidism.

When a patient commits suicide by resisting correct advice, he usually blames results on everyone except himself. He followed the rule and changed physician. Three years ago, an original diagnosis of malaria was changed to typhoid, and later to cerebro-spinal meningitis. All along the odor from his mouth had been such that it was difficult to stand near his bed. The nurse had attempted the classical swabbing with half-strength H_2O_2, but his mouth was so painful that he had resisted, even though he had most of the time been in a semi-comatose condition, and seldom conscious. At times he fought to get out of bed. What is clear is that septicemia had at last affected the cerebellum. The certificate gave "infectious malaria" as the cause of death. Some form of infection was realized somewhat late.

The first fatal case related is typical of septic systemic developments where a frail constitution lacks resistance to infection. The second portrays a strong constitution collapsing under a double morbid assault, after having clearly shown its ability to mend if not robbed of adequate aid; while a resisting organization of a class intermediate between the two already pictured would, without the maintenance of proper treatment brought to a successful issue, break down under the single infection of purulent root sockets, with periods of high and low resistance, until a fatal termination develops at the end of the usual varied and contradictory medical diagnoses, always because the fundamental etiology is not suspected.

It would not help the scope of this article, else I could indulge in the relation of more cases of oral sepsis with fatal terminations, observed during a period of fifteen years since my eyes have been opened to them.

A case belonging to the class of single etiology and strong resistance presses itself so vividly forward as I write that I will relate it briefly. However, to make its narration really useful, let it be taken as typical of the march of the effects of systemic infection on the nervous centres, which other cases also illustrate. When other organic lesions complicate the morbid picture, there may be seeming temporary modifications, but the fundamental march remains clear in the background. The cerebrospinal system is first involved, then the cerebrum, and finally the cerebellum. The factors of resistance and of single or complicated etiology determine whether this march is completed in a few months or in a number of years. Therefore, relating a last case simply as a final illustration:

Married lady, 36 years, became nervous and unusually irritable; robust, no organic trouble of any kind; perfect teeth, but shortly afterwards roots were drifting and pus was in sockets. All functions good. First symptom of septicemia was articular arthritis. Headaches gradually growing in frequency and intensity. No constipation. Proper mouth treatment never instituted because neither her physicians nor her husband realized its proper character and necessity. Two years later, gastritis began the collapse. Increased headaches; dizziness which resulted in a fall. Due to strong resistance, the first spell of delirious fever did not occur until a couple of years still later, from which she rallied and remained a comparative invalid. Diagnosis had varied from cerebral congestion to a blood clot, and in the next two years another spell of fever closed the drama, during the last act of which the odor from the mouth had been unbearable. A portion of the time the diagnosis was a tumor, and at the end it changed to abscess in the brain. The septic and primary cause of disease was recognized in death.

Owing to unusually great systemic resistance to infection, or to alveolar conditions and root developments which rapidly shed out diseased roots, or force their extraction, the majority of Riggs' disease patients become edentulous in time to escape loss of health. Knowing only their own experience of discomfort with natural organs and ease with prosthetic ones, they unintentionally mislead their closest and dearest fellow beings with the statement that they are far better off with their artificial dentures than ever they were with their natural teeth, quite ignorant of the fact that their chewing power has been reduced five-sixths, and that it is always a question how long digestive and assimilative functions can supply the increased work required of them, before some dangerous disequilibrium develops.

The saddest part of it all is that Riggs' disease is preventable. Nature's plan is the frequent, vigorous mastication of hard, fibrous, raw, vegetable or animal material, coupled with constant active exercise in the open air, often interrupted by periods of rest in a horizontal position. Details studied out from these facts, and their fundamental physiology and prophylaxis would write an article as long as this one already is.

Mind supplies the artificial substitutes for local prevention. They consist in the proper brush and proper polishing on oral hard tissues, supplemented by polishing tapes on approximal surfaces; all being started in childhood, repeated at proper times to prevent any fermentation and the formation of any deposits anywhere at gum margins, with the proper motion of bristles to stimulate blood circulation without injuring either hard or soft tissues. This, started in early life, and thereafter permanently maintained, constitutes practically absolute local prevention. Home p ophylaxis which is not scientifically thorough is not absolutely reliable, and it becomes the guardian of health in a measure only, but always in a most generous measure. Here again, pages upon pages could be written.

The fundamental prophylaxis applying to the systemic background, and hinted at in Nature's plan, can never be disregarded, whether from childhood up or when Riggs' disease shows its incipient symptoms, or its advanced stages. That plan guides and teaches the reliable therapy to apply. We could pause here again to consider a multitude of details to follow out. It is idle to stimulate surface capillaries with bristles unless the pump is helped to rhythmically and powerfully fill underlying pipes with blood of improved quality to dislodge venous congestion and destroy infection.

It is incipient Riggs' disease conditions which we must learn to reliably discern, if we will protect our fellow beings against disease, and in some cases against death. This is the stage when the battle can be fought with assured victory, and with the least effort on the part of the operator and patient. Later, the field is strewn with lost limbs.

Oral sepsis begins coincidentally with habitual or frequent fermentation, and the danger signal is there. Facilitate home prophylaxis to patients, make it less irksome and more reliable by properly proportioned and shaped utensils to be used in conjunction with scientifically efficient mouth preparations. Teach them *how, when and why;* and in direct proportion as we truly help, we require more and better co-operation, and we expect and obtain better results.

Office prophylaxis and Riggs' disease surgical treatment fail without proper, faithful, home prophylaxis, performed with the help of reliable therapeutic adjuncts. This would add another chapter; but the strongest guardian of health is found at home, both locally and systemically.

Nothing better was ever done for humanity than the institution of school mouth hygiene, but if we will advance the cause of health and happiness, and hasten that millenium, we must also include adults.

The Price of Power

By Mary R. Baldwin

Lone watcher near the place of power,
Meeting thine awful trial hour,
Ask not deliverance from the fire,
But hold thyself to the desire
For gift of power.

When glows the furnace at white heat,
And all the furies seem to meet,
Dare not to even whisper low
A prayer for the release from woe,
But wait for power.

When in the flame the life is tossed,
And all the brightest hopes seem lost,
Forth from the seething depths will rise,
Wreathed in the radiance of the skies,
The heaven-sent power.

HEALTH CONSERVATION

THE MOUTH AND HEALTH*

BY G. E. HUNT, M.D., D.D.S., INDIANAPOLIS, INDIANA

THERE IS ONE FALLACY that has ingrained itself upon the American people that I want to explode, if possible, here and now, and that is that the voice of the people is the voice of God. We are very prone here in America to proclaim that whenever the people decide a thing, it is decided rightly, and if we can get a subject to the people that they will give us a correct decision on it. On all questions of social or economic improvement the only thing you can positively rely on the American people to do is to get absolutely on the wrong side of the question, at least at first. There never was a question brought up for the betterment of civilization that the American people, as a mass, were not at first opposed to. These things have to be brought about by the earnest efforts of men who are called cranks for many years, and afterwards hailed as heroes—when they are dead. To illustrate, let me call your attention to Jenner, who first introduced vaccination. He was villified on every hand, was called a poisoner and other names even stronger than that, and even up to the present day there are a great many people in the world, anti-vaccinationists, who talk against it as a preventive of smallpox, and who are doing all they can to prevent the use of vaccines for smallpox. A number of people are opposed to vaccine and serum therapy. I am not talking at all against what Doctor Emerson said, because I believe everything he said, but he didn't tell you there was nothing in serum therapy or vaccine therapy; he did say there was nothing in vaccine therapy with dead organisms. Right in our midst here, inside of a week, we have had an example of its remarkable value. Dr. Leslie Ferniss was attacked by cerebro-spinal meningitis a week ago last Saturday night, and some serum was taken from the base of the brain and organisms found. He was given an injection of the serum, and in 24 hours he was conscious again, and in 48 hours he was almost a well man. Last Monday he was pronounced dead, and now he is well. And yet some people are opposed to serum therapy. It illustrates how difficult it is to bring the masses of the people along with you on new matters of thought.

Doctor Hurty has told me frequently that when he was a young man his father started through the state of Indiana advocating compulsory education for children, something we never think of cavilling about today, we are so accustomed to it and know the advantages of it so thoroughly that we accept it as something we couldn't get along without; and yet when compulsory education for children was advocated anywhere in the United States it was derided, the men that advocated it were reviled in the strongest terms, it was called paternalism (as so many things are called paternalism today) and it was a long time before the American people would accept compulsory education for children. In the olden days, in London Town, people used to throw slops right out in the streets. Nobody thought it out of the way because everybody did it, and I have no doubt at all that the first man who came along and said, "Let us not throw these slops in the streets any more," was looked upon as a man trying to interfere with the personal liberty of the citizens, and that he was *persona non grata* to the people of London. So it is all over.

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*An address before the Indiana State Dental Society, 1914.

This attitude that the American public, and all publics, I presume, take toward innovation is due to the mores. The mores of a people, you know, are the customs which have become so firmly fixed that they are a part of the life of the people. It is in the mores of our time that we should wear clothes, and if you attempted to walk down Washington street in a figleaf, you would be arrested, because it is in the mores that you should not do that, and yet in some countries they do that. It is not in our mores, but in those of some other people that they should wear nose rings. If you should go to them and say, "You should not wear nose rings; where I came from they do not wear them," they would say to you: "We do not care what you do where you came from. My grandparents wore nose rings, and my father and my mother wore them, and I have always worn a nose ring, and I am going to continue to wear them; all our people wear them." That is the mores, and it is the mores that makes it so difficult for us to introduce any innovation in a sociologic or economic way; it is the mores which the physicians have met in their efforts to ameliorate conditions among our school children, and it is the mores you and I are going to meet when we attempt to do the same thing.

A couple of years ago Doctor Howard came to me and said he was going to introduce a bill in the legislature for the inspection of school children, "and I think you should put in a word for dental inspection of school children." And I thought it was a good idea. He said, "We are going to have a good bill, compulsory medical examination of school children; every child going to school to be examined, and if there are any physical defects we will correct them, and we will have a fine race of children growing up here." He came back in a month and said, "We had a little difficulty when we came to talk to the men we wanted to put this through, and we finally decided it is best at this time to only ask for permissive school inspection. The bill would say that the school authorities had permission to spend school funds for that purpose if they desired to do so. He explained that was the best they could do. Mores again. If they had tried to get a compulsory examination bill through, they would have been howled at; that treating the poor was too much paternalism. He handed me the bill, and wherever it said medical inspector, I wrote over the top of that, "or dental inspector," so that everything that applied to medical inspectors applied to dental inspectors, and Howard said, "That will be fine."

So he went with the bill to the legislature, and they went up in the air. Mores again. They never had had either dental or medical inspection, but they were educated high enough so they were willing to take medical inspection, if left permissive, but dental inspection was the most absurd thing on the face of the earth. They said, "If you leave this bill as you have it here, mention dental matters at all, we cannot put the bill through." And so we had to strike it out, and we have no provision legally in the state of Indiana for dental inspection. That is mores. How overcome it? Only by patient and persistent educative efforts. We have done some of it here in Indiana. Not nearly enough. You must educate the people patiently and persistently. The voice of the people is not the voice of God, by a long ways. The voice of the people is the voice of procrastination and of standpatism always.

We must get at these people in a good strenuous campaign of education. To show you where the dental profession and the medical profession touch lips in this campaign for prevention of disease, Doctor Emerson has told you that not all the infections of the body are due to the mouth. I do not think anybody ever thought they were. But he has told you many of the infections of the body are due to the mouth. That is all anybody with real good common sense ever claimed.

I divide all diseases into two classes. This is not a scientific division—is not to be found in the textbooks; I invented it myself, and I do not expect it to be adopted generally as a teaching division. Diseases of Faulty Metabolism, where there is faulty nutrition somewhere in the body, the body cells are out of kilter, the carburetor is not mixing properly; and the other set of diseases, Disease of Infection. Many of the diseases we have of faulty metabolism come very close to the diseases of infection, because every month we are passing diseases of faulty metabolism over into the section of infection diseases. But here are a lot of diseases, some of which may be due to infection, such as rheumatism, and gout and cancer and stomatitis and colitis, and all the various forms of anemia, and cases of auto-intoxication; all those cases are faults somewhere in bodily metabolism, and they cannot help but be very closely related to what you eat, how much you eat and how you eat it. When you come to consider that the condition of the mouth at least will depend upon how you eat, if it doesn't control how much you eat and what you eat, you will see the mouth is a very important part of the human anatomy. The condition of the mouth touches that class of diseases very closely and a man with a badly constructed plate or filling, or a dozen other conditions we are all conversant with, may be unable to chew his food properly, and that will be a predisposing cause of the disease, because of faulty metabolism.

Now, infection diseases. Many are infected through the mouth, and except for causes of traumatism, where there is broken skin, all of the infections have to get into the body through one of the portals of entry. Some get in through the nose, ears and eyes, but the great number come in through the oral cavity, more than through all the other natural portals of the body combined. If that is true, certainly the condition of the mouth must be a predisposing factor in the majority of infections of the body. There are infections in the mouth that come through some other portal, but in view of the fact that so much of our infection comes from our food and our drink, all of which passes through the oral cavity, and from the air, much of which passes through the oral cavity, we are safe in assuming that a large amount of the infections of the body pass through the mouth. We cannot do away with all of them, but the condition of the mouth cannot help but be a largely predisposing factor in many of these infections. The better physicians have learned this. They learned it before we did—just between ourselves—and it has been a good deal of trouble for them to hammer it into our heads. And we are today in a good position to help them, and they are in a receptive position toward us, and the dental and medical professions, within their own limits, should go on shoulder to shoulder and lip to lip without the slightest symptom of disagreement between them. But before we can do that intelligently, and expect the medical profession to accept our aid, we must be a little more broadly educated than we have been in the past, broader in pathological knowledge. We have been pretty good with diseases incident to the teeth and mouth generally, but we must be general pathologists, not in minutiæ but in general. Educate the medical profession; they are not especially erudite in anything but their own special work, and we should not be expected to be either, but we must have a broad knowledge of these things, and when we are in position, mentally and intellectually, and can show to the medical profession that we are competent to aid them in this campaign against disease, there will be no friction between the medical and the dental professions. We must work towards that, this broader knowledge of pathology that will enable us to take our stand side by side with men of medicine in the prevention of disease.

The Very Idea

Two suburban mothers met on the train one day, and the topic of their conversation was their daughters.

"How did your daughter pass her examination for a position as teacher?" asked one.

"Pass!" was the answer. "She didn't pass at all. Maybe you wouldn't believe it, but they asked that girl about things that happened long before she was born." —*Lippincott's.*

WHAT DETROIT IS DOING IN MOUTH HYGIENE*

BY C. H. OAKMAN, M.D., D.D.S., DETROIT, MICHIGAN

THE PRESIDENT TOLD ME this afternoon that I would have to cut short my speech, that I would have about five minutes to talk. He said, "If you get warmed up I know you will talk at least an hour, so, for Heaven's sake, don't get warmed up." I said, "I can't get warmed up in five minutes from a flying start;" so I concluded to make a dead start.

The great necessity of oral hygiene in the city of Detroit has been so conclusively demonstrated within the last two years that we now ask that an appropriation of $20,000 be included in the Health Board budget, to carry on this branch of work.

Should we receive this amount, we shall be able to treat in the clinics 75,000 children. A year ago we received an appropriation of $8,000. 50,000 children were inspected in the schools and 12,000 were treated in the clinics. In the last six months 67,000 children have been examined and 10,650 have been treated in the clinics. So you see we are within a small percentage of doing in six months what heretofore it took twelve months to accomplish. We are attaining greater efficiency each month.

The operators and inspectors love their work and are in it, not for the small salary they receive, but because they have become interested in the work. It was really necessary for me, in order to secure these inspectors and operators, to beg them to come in. They couldn't see much in it, but I dare say that there is not an operator or inspector who would now care to leave the cause of oral hygiene. It is something greater than money; it is the desire to see something accomplished, to know that someone is being benefited, freed from pain and frail bodies raised up and made strong men and women.

I doubt if, in the next two decades, we will need as many inspectors as we have at the present time, even though our population will be greatly increased, for the simple reason that it is fair to presume that the children of today will be fathers and mothers in the next twenty years. They will have learned their lessons in oral hygiene and it will be second nature to them to impart these lessons to their children. Many of us never had the opportunity to receive such information from our parents. I earnestly believe that cancer and many other diseases will be greatly lessened in the next few years, due to better knowledge and practice of oral hygiene.

We have shown our aldermen that the work we are doing is of a really humanitarian character; they realized it after looking into the mouths of dozens of children, seeing the bleeding gums, the great cavities and abscesses, the pale faces and the frail conditions of the bodies of these poor children.

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*An address before the Michigan State Dental Society, 1914.

One demonstration, that of a boy nine years of age, who had a malignant growth in the roof of his mouth, was sufficient for our cause. A microscopical examination of an apparent simple ulcer proved it to be a cancer (sarcoma). An operation was performed and the little fellow is now attending school, gaining weight and enjoying good health.

Illustrations, made by an artist before operation, were shown the aldermen and after operation the boy was presented for inspection. They were elated to know that dental school inspection was the means of saving this boy's life.

I just mention this case to show that had it been neglected, in six months' time the disease would probably have permeated the system and the cancerous condition could not have been eradicated, and the result would have been loss of life.

When this little fellow was brought before the aldermen, the chairman of the committee on Health and City Hospitals of the Common Council said, "This is really a humanitarian work and I want to go on record right now to do all in my power to secure this appropriation." Other members present acquiesced in these remarks. I said, "Mr. Chairman, this boy is going to live to be twenty-one, unless some accident befalls him, and he lives in your district and I think he will vote for you some day." He asked the boy where he lived and the boy answered, "I live in the third ward."

After this conference we realized all that was necessary was to show the city fathers and other authorities the absolute need of the work. A few practical demonstrations like the above will do more good than all we could write.

In our clinics we see many cases of deformity due to poulticing the face when alveolar abscesses were present. If we could instill into the minds of the people that poulticing the face is little less than criminal, we would accomplish a great deal and it would be real progress in oral hygiene.

The people should be taught through the daily press the great dangers of this method. The results are often the loss of part or all of the jaw, septicemia, unsightly scars; in some cases even death. These are sad cases, especially so when little children must suffer through the ignorance of a well-meaning parent or neighbor.

There are a few thoughts which I wish to drive home to you tonight. One is, if each member of this audience will start in tomorrow determined to find one child before the day is over and inquire about the hygiene of that child's mouth and advise accordingly he will have done a good work. If this were carried on for a year what a change would take place. You, brothers and sisters, mothers and fathers, should support this cause and I will tell you why in a few words.

Cases of so-called rheumatism (arthritis) are ofttimes caused by pyorrheal pus, or the pus from abscesses in the jaws, etc. The living organisms of this pus are quite virulent at times, and we know from experience that by taking these same germs, propagating them, isolating them, and killing them by heat and injecting them back into the body it will raise the patient's resistance and often effect a cure. These are known as bacterins or vaccine treatments.

Let me cite the following case history: Mrs. L., aged 25 years, appeared at one of our Health Board clinics and stated that she had suffered from aching teeth, abscesses and pyorrhea for the preceding seven months, during which time she was pregnant. She was unable to eat solid food for months. Three weeks after her baby was born she was sent from the clinic to me for treatment. She was scarcely able to walk, was anemic and showed plainly that she was suffering from sepsis, which could be traced to the neglected mouth condition. Owing to the purulent condition of the gums and the hypersensitiveness of the teeth and adjacent tissues, treatment at first was somewhat limited. Light pressure on the upper gums would cause pus to flow over and drip from the teeth. A similar condition existed in the lower jaw. The gums were highly congested and of a boggy consistency. Her appearance was cachetic and her facies showed that she had undergone great suffering. She stated that she had contemplated suicide many times as her condition was well nigh intolerable.

A microscopical examination of the pus revealed the streptococcus, staphylococcus and colon bacillus from which an autogenous vaccine was made. At the start 200,000,000 streptococcus and staphylococcus stock vaccines were injected. Cathartics and mouth washes were prescribed and the patient ordered to return in five days, at which time the autogenous vaccine treatment was instituted. Five days after the first injection the whole condition showed a marked improvement and a manipulative pyorrheal treatment was inaugurated.

Persistent treatment was continued for one month, by which time the patient was able to eat solid food and resumed her interest in things in general. Pulps had been removed, cavities filled and some teeth extracted, all of which tended to alleviate the condition.

It should be stated that her nursing baby was suffering from an acute malnutrition and on informing the Mothers' Clinic at the Board of Health of the conditions, the child was weaned. I believe that had these conditions existed in the heated term, they probably would have caused the death of the child, if not also that of the mother. As it is, the mother and child are now enjoying perfect health. To me this incident, as well as similar cases, seems ably to illustrate the fact that the mouth conditions of nursing mothers are more or less associated with infant mortality.

Referring to the co-operation of the Board of Education and the Board of Health, in this we are fortunately situated, for there exists between those bodies a unity of purpose. Dr. Charles E. Chadsey, superintendent of schools, has always been in favor of anything that would benefit the welfare of the child, physically or otherwise, and through close relationship and fraternal feeling we are able to carry out many ideas and have the co-operation of the teaching body.

While listening to Governor Ferris I thought if I had the power to appoint a few men to carry on an oral hygiene propaganda throughout the state of Michigan, I would like about three men of his caliber to preach the gospel of mouth sanitation to the masses.

I was not aware that he knew so much about oral hygiene, but he has certainly taken the part this evening as quite a teacher in this work, and I know that if you men and women here tonight give heed to what the governor has said, a great amount of good will be accomplished.

I thought the governor made a mistake at one time, a grievous mistake, but I wish at this time to apologize. I have come to the conclusion that he has not. I will admit that the State Dental Board is as good, but not any better, than heretofore, even though my friend was not reappointed.

I do not wish to lead you to believe that oral hygiene is the main factor in preventive medicine, but it is an important factor. While the dental profession has been in the dark for many years, I think Dr. Charles Mayo, of Rochester, Minn., the noted surgeon, has been a means of drawing attention to it, and while he said, "It is for the dentist to act"—and I want to say right here that he has been acting mighty fast during the last fifteen months, and scientific men have been acting before but hadn't been acting long enough to have their experiments proven. I hold tonight that in the next decade the dental profession will have accomplished a great deal for humanity.

EDITOR'S NOTE.—Since this meeting in April, the writer is glad to state that the twenty-thousand-dollar appropriation asked has been received.

Knowledge and Wisdom

Knowledge and wisdom, far from being one,
Have ofttimes no connection. Knowledge dwells
In heads replete with thoughts of other men;
Wisdom, in minds attentive to their own.
Knowledge, a rude, unprofitable mass,
The mere materials with which Wisdom builds,
Till smoothed and squared, and fitted to its place,
Does but encumber whom it seems to enrich.
Knowledge is proud that he has learned so much;
Wisdom is humble that he knows no more.

—*Cowper.*

EDITORIAL

What Constitutes a Reputable Dental College

The term "reputable" dental college seems to be somewhat ambiguous so far as State Dental Examining Boards are concerned.

One dental law states that the candidate for examination by the board must present a diploma from some reputable dental college duly authenticated by the laws of this state or some other of the United States.

Another law states that the candidate must be a graduate of a recognized dental college.

Another, that the candidate must be a graduate from a school of dentistry whose term and curriculum are equal to that of a majority of the schools of dentistry of the United States.

Another law states, any graduate of a dental college.

Another, a diploma from a college recognized by the National Association of Dental Faculties.

Another, a diploma from a college recognized by the National Association of Dental Examiners.

Another, a diploma from some dental college in good standing.

The Ohio state dental law specifies, a graduate of a reputable dental college as defined by the Ohio State Dental Board. And the board proceeds to tell in unmistakable terms what it considers a "reputable" dental college.

Its definition is as follows:

Resolved, That on and after July 25th, 1914, a dental college to be recognized as a reputable dental college by the Ohio State Dental Board of the State of Ohio, shall comply with the following requirements:

1st. It shall strictly comply with all claims in its announcement, and enforce all standards and requirements.

2d. It shall require for admission at least fifteen units of high school education as defined by the State Superintendent of Public Instruction, which must be fully completed before matriculation in the dental college.

"A unit as defined by the State Superintendent of Public Instruction is a forty-five minute recitation each day for five consecutive days in one week on one subject contained in the curriculum of a first-class high school, and for not less than thirty-two weeks in one year."

CREDENTIALS ACCEPTABLE

A diploma from a reputable college granting the degree of A.B., B.S., or equivalent degree.

A TEACHER'S LIFE CERTIFICATE

A certificate signed by the superintendent of a first-class high school or kindred school showing the candidate has completed fifteen units of high school work.

In the absence of the foregoing credentials, the applicant, before he shall matriculate, shall pass an examination in such subjects as are required for graduation from a first-class high school, before a state superintendent of public instruction or his deputy, and to pass the aforesaid examination shall be sufficient qualification to entitle such applicant to a certificate from the aforesaid officer, which certificate shall be accepted as equivalent to fifteen units of high school work.

3d. It shall require that students be in actual attendance in the college within ten days after the beginning of each annual session, and thereafter.

4th. That actual attendance of classes be insisted upon and that no credit be given under any circumstances for less than eighty-five per cent. of attendance on each course. The evidence of such attendance shall be determined by actual roll call, and be made a part of the student's record.

5th. That advanced standing be granted only to students of other reputable colleges after official credits covering entrance credentials and dental work have been received directly from the officers of said college.

6th. There shall be a careful and intelligent supervision of the entire school by the dean who holds and has sufficient authority to carry out fair ideals of dental education as interpreted by modern demands.

7th. There shall be a clear and concise system of records showing the credentials, attendance and grades of the students, and original credentials presented by the student for entrance or advanced standing shall be kept on file.

8th. The college shall give a fully graded course covering at least three years of at least thirty-two weeks each, exclusive of vacations and holidays, and at least thirty-six hours per week of actual work for each student shall be maintained, and this course shall be clearly set forth in a printed schedule of lectures, classes and laboratories.

9th. The college must have thoroughly modern equipped laboratories in anatomy, histology, embryology, physiology, bacteriology, metallurgy, chemistry and prosthetics.

10th. The college must have a thoroughly modern equipped clinic room; it must be equipped with modern operating chairs, sanitary cuspidors, sterilizers and modern asepsis insisted upon; the operating clinic must at all times be in charge of a demonstrator who is an experienced licensed graduate dentist.

11th. The college must have experienced and capable instructors in all the laboratory branches.

12th. The college must have access to a hospital in order that its students may see and study cases in oral surgery.

13th. The college must have access to a dissecting room, and require each student to dissect two full parts, one part to be the head.

14th. The college must have facilities for and require each senior student to actually construct and insert at least one bridge of not less than four teeth, to construct and insert not less than two full dentures, to be constructed on an anatomical articulator, to construct and insert not less than five Richmond or gold crowns, to cast and place in the mouth not less than five gold inlays, to make at least twenty-five gold fillings, and at least twenty-five plastic fillings.

15th. The college must have a working dental library of not less than two hundred volumes of thoroughly modern text books and reference books. The library room must be easily accessible to the students, during all or the greater part of the day.

16th. The college must show evidence of modern methods in all departments and evidence that the equipment and facilities are being intelligently used in the training of dental students.

17th. The college must have a working dental museum, with its various anatomic embryologic, pathologic and other specimens carefully prepared, labeled and catalogued, so that any specimen may be easily found.

18th. The college must give not less than one hundred and sixty hours on anatomy; not less than thirty-two hours on each of the following subjects: anesthetics, and oral hygiene; not less than ninety-six hours on each of the following subjects: orthodontia, and metallurgy; and not less than one hundred and twenty-eight hours on each of the following subjects: operative dentistry, prosthetics, oral surgery, pathology, histology, bacteriology, physiology, chemistry, materia medica, and therapeutics. This time must be wisely divided between lectures, recitations and laboratory work and must be full clock hours.

19th. Colleges which present satisfactory evidence to the board that they comply with the aforesaid requirements will be placed on an acceptable list.

20. *The graduates of all colleges which do not comply with the aforesaid requirements will be refused an examination by the Ohio Dental Board.*

21st. The college must also publish a clear statement of its requirements for admission, tuition and all other charges and fees, the time of attendance on classes, sessions, and the names of all graduates and matriculants.

Passed by the Board and effective on and after this date and applies to all students entering a dental college during 1914 and thereafter.

H. C. MATLACK, D.D.S., *Pres.*
HOLSTON BARTILSON, *Secy.*

"Legitimate Practice of His Profession"

To obtain a ruling under the Harrison Anti-Narcotic Law to cover the cases of dentists who have not complied with the state dental law, the Kentucky State Board of Dental Examiners recently addressed a letter to the commissioner of internal revenue, asking the intent of the words: "legitimate practice of his profession."

In reply to the collector of internal revenue, the commissioner ruled that the terms "legitimate practice of his profession," as used in the Harrison Anti-Narcotic Law, require that a physician, dentist or veterinary surgeon, in order to register under the provisions of this law, must have complied with all of the laws of the state in which such physician, dentist or veterinary surgeon resides.

This ruling makes the law plain as regards this phase of it and applies equally to all of the states of the United States.

Chronic

Small Boy (to charitable lady)—"Please, mother says she's much better of the complaint wot you gives 'er quinine for; but she's awful ill of the disease wot's cured by port wine and chicken broth." —*Tit-Bits.*

MISCELLANY

DENTAL FUND FOR WAR SUFFERERS

At the meeting of the American Institute of Dental Teachers held at Ann Arbor, Michigan, on January 26th, it was decided to take steps that should result in the raising of a fund to be used through the Red Cross Society, in giving relief and aid to the soldiers in Europe who are suffering from oral and dental injuries. The president was instructed to appoint a committee to take charge of this matter. President F. W. Gethro, under this instruction, appointed the following Executive and General committees:

Executive Committee—Henry W. Morgan, E. A. Johnson, Ellison Hillyer, John F. Biddle, Sec'y; C. R. E. Koch, Chairman.

GENERAL COMMITTEE

E. C. Kirk, Philadelphia
J. H. Kennerly, St. Louis
H. C. Miller, Portland, Ore.
D. M. Gallie, Chicago
John F. Biddle, Pittsburgh
E. T. Darby, Philadelphia
Alfred Owre, Minneapolis
B. Holly Smith, Baltimore
E. A. Johnson, Boston
Frank Holland, Atlanta
D. M. Cattell, Memphis
Frederick R. Henshaw, Indianapolis
S. W. Bowles, Washington
E. H. Smith, Boston
A. H. Hipple, Omaha
Ellison Hillyer, New York
Truman W. Brophy, Chicago
H. E. Friesell. Pittsburgh
Henry W. Morgan, Nashville
I. N. Broomell, Philadelphia
Wallace Wood, New Orleans
Frank T. Breene, Iowa City
H. L. Banzhaf, Milwaukee
J. G. Sharp, San Francisco
G. V. Black, Chicago
W. T. Chambers, Denver
H. M. Semans, Columbus
J. D. Patterson, Kansas City
N. S. Hoff, Ann Arbor
C. N. Johnson, Chicago
H. L. Wheeler, New York
L. E. Ford, Los Angeles
C. R. E. Koch, Chicago
H. B. Tileston, Louisville
D. H. Squire, Buffalo

The Executive committee is contemplating the issue of contribution certificate booklets. Each booklet will contain twenty (20) certificates or coupons certifying that the holder thereof has contributed 25c to this fund. This certificate will be neatly lithographed, something like national currency. It will be printed in lilac ink—the color of the dental profession—and bear upon its face the Red Geneva cross.

It is hoped that the dental schools, dental students and dental societies, as well as the profession at large, will become sufficiently interested in this propaganda to secure a large enough fund, through these small contributions, to secure real relief for the class of war sufferers for which it is designed. That it may aid in the establishment of several special hospitals or wards devoted to dental and oral surgery injuries, within the belligerent zone of Europe, is the ultimate purpose of this movement.

Applications for these booklets should have been made to Dr. John F. Biddle, of Pittsburgh, Pa., Secretary of the Executive committee; or to Dr. C. R. E. Koch, 31 West Lake St., Chicago, Chairman of the committee, before March 1st. After that date all the members of the Executive committee and General committee will be in a position to supply them.

Dr. J. N. Crouse and the Dental Protective Association

At the annual meeting of the Dental Protective Association held in December, 1914, being the first meeting subsequent to the death of Doctor Crouse, a committee was appointed to prepare for publication a statement which might serve to show the appreciation of the members of the association for the character and great services to the dental profession of Dr. J. N. Crouse, who organized the association and was its president and executive head until shortly before his death.

Doctor Crouse displayed great ability and tremendous force of character and enthusiasm and perseverance, which finally overcame the general indifference and much active opposition of the dental profession, and won a sufficiently numerous membership in the Protective Association to provide enough funds to resist successfully the claims of the Crown and Bridge Company. The defense was so complete that the Crown and Bridge Company never collected anything of consequence from the dental profession. If the dentists had been obliged, for a year or two at first, to pay the licenses demanded by the Crown Company, as they had previously done for many years to the Goodyear Dental Vulcanite Company, the great services rendered by Doctor Crouse through the Dental Protective Association, would have been universally acknowledged. As it was, appreciation for his services was less in evidence than a persistent and essentially unfair complaint and criticism of Doctor Crouse personally, and of his management of the affairs of the Protective Association. It did not seem to be understood that a plan of organization similar to that of our dental societies is not well adapted to fight a legal battle. It was indispensable, as in war, that one man should be in supreme command, able to choose his own helpers and subordinates, and to command the entire resources of the association for instant action whenever necessary. So far as appears, there was no other man in the dental profession who had the ability, and the willingness to make the personal sacrifices necessary to accomplish what he did. The value of his services to the profession can never be known; that it amounted to millions of dollars there is no room to doubt.

Doctor Crouse always took an active interest in the welfare and progress of his profession and for many years he was a familiar figure to all who attended dental society meetings anywhere. He came to Chicago from Mount Carrol, where he was then practicing, to become one of the charter members of the Illinois State Dental Society, and for some time before his death he was the only surviving charter member who had maintained his membership continuously. He was active in the administrative affairs of the three principal societies to which he belonged; the Chicago Dental Society, the Illinois State Dental Society and the American Dental Association, (which was merged into the present National Association). He was president of each of them, and was for many years a member of the executive committee of the American Dental Association.

The last important service to the Dental Protective Association was the arrangement with Doctor Taggart by which the members of the association received licenses under his patents for a trifling sum; (less than a dollar a year for the terms of the patents). In this he had the active assistance of the other directors, Dr. C. N. Johnson and Dr. J. P. Buckley, and without all three of them the plan probably would have failed.

Doctor Crouse did not receive in his lifetime the honor and appreciation from his profession that his great services deserved and which undoubtedly will be accorded to him in the future. He will have a place among the great benefactors of the dental profession.

J. E. Hinkins,
C. E. Bentley,
Edmund Noyes,
Chairman

In Memoriam

Whereas, Almighty God in His infinite wisdom has seen fit to remove from the scene of his earthly labors, Dr. Oliver M. Nisley, and,

Whereas, The Lafayette Dental Society desires to record its appreciation of him as a man and brother practitioner, and its sense of sorrow at his death; therefore be it

Resolved, That the Lafayette Dental Society extends to the family of the deceased their sincere sympathy in their bereavement, and that this resolution be spread upon its minutes and a copy be sent to his family; also to The Dental Summary for publication.

E. V. Burt,
C. G. Ross,
M. E. Le Galley,
Committee

OBITUARY

Dr. Ralph E. Luther

Died February 12th, at St. Luke's Hospital, Chicago, Ill., from pneumonia, in his thirty-ninth year, Ralph E. Luther, D.D.S., of Batavia, N. Y.

Doctor Luther was born in Warsaw, October 26, 1876. He was a graduate of the Warsaw high school and dental department of the University of Buffalo, class of 1900, and in September of the same year commenced the practice of dentistry in Batavia.

He was married to Miss Marion Duncan in 1901, and is survived by his wife, two sons, Duncan and John, his mother, Mrs. Mary E. Luther, two brothers, Kendrick, of Syracuse, and Guy S., of Schenectady, and a sister, Mrs. Roy McGregory, of Batavia.

Doctor Luther was a charter member of Mu Chapter Xi Psi Phi fraternity, and has served as Deputy Supreme President. He was a member and past president of the Eighth District and Batavia Dental Societies, and a member of the Dental Society of the State of New York, and chairman of the committee on Oral Hygiene, the National Association and Rochester Dental Society. He was also a member of the Masonic fraternity, and various other local organizations, but was particularly active in affairs of the Young Men's Christian Association and Boy Scouts, where he rendered much valuable service by his untiring energy and enthusiasm.

Doctor Luther took a prominent part in matters connected with oral hygiene, and was one of the pioneers of the work in this state. He had made a specialty of pyorrhea work and just prior to his death had completed a course in Chicago. Doctor Luther was a man of fine ability as an operator, and gave much promise of a brilliant future. He was an upright, conscientious, high-class professional man, who observed all the finer rules of conduct toward his patients and the profession. He was a splendid type of a high-toned professional gentleman. In his death the profession loses an intelligent, able and indefatigable worker, and his family and friends a kind, generous and lovable companion and friend. His loss will be deeply mourned by a large circle of friends and acquaintances, who honored him for his many attractive qualities of heart and mind.

—H. J. B.

SOCIETY·ANNOUNCEMENTS

The Georgia State Dental Association

The forty-sixth annual meeting of the Georgia State Dental Association will be held in Atlanta, Ga., at the Piedmont Hotel, June 17th, 18th and 19th, 1915, beginning at 11:00 A.M., Thursday, June 17th. We have every assurance that this will be an interesting meeting.

Every ethical dentist in Georgia is respectfully invited to attend, and become a member of this organization. Also, a most cordial invitation is extended to members of other associations to meet with us.

For further information address M. M. FORBES, *Secy.*,
803-4 Candler Bldg., Atlanta, Ga.

Lake Erie Dental Association

May 20,21,22—just the time of year that tired feeling begins to steal over you. Why not attend the Lake Erie Dental Association, at Hotel Bartlett, Cambridge Springs, Pa.? Good papers and clinics and a delightful spot to spend the week's end. J. F. SMITH, *Secy.*

Illinois State Dental Society

The fifty-first annual meeting of the Illinois State Dental Society will be held at Peoria, Ill., May 11, 12, 13, 14, 1915.

J. M. BARCUS, *Pres.*,
Carlinville, Ill.
HENRY L. WHIPPLE, *Secy.*,
Quincy, Ill.

Michigan State Dental Society

The Michigan State Dental Society will hold its annual meeting at Grand Rapids, April 15, 16, 17. The meeting will rank second to none ever held in the state. Hermann Prinz, D.D.S., M.D., Professor of Materia Medica, Philadelphia, Pa., will give an illustrative lecture on Local Anesthesia. Dr. A. S. Warthin, of the University of Michigan, Dr. J. H. Kellogg, of Battle Creek, and others have promised papers. One session will be devoted to progressive clinics, and one session to regular clinics. The manufacturers' exhibits will be many and complete.

Dr. Edwin J. Chamberlain, of Grand Rapids, will reserve space upon request, and Dr. O. W. White, Fine Arts Bldg., Detroit, will mail programs to non-members upon request.

F. WARD HOWLETT, *Secy.*,
Jackson, Mich.

The Susquehanna Dental Association of Pennsylvania

The fifty-second annual meeting of the Susquehanna Dental Association will be held at Irem Temple, Wilkes-Barre, Pa., May 18th, 19th and 20th, 1915.

GEO. C. KNOX, D.D.S., *Rec. Secy.*

The Louisiana State Dental Society

The thirty-seventh annual meeting of the Louisiana State Dental Society will be held in New Orleans, June 3, 4, 5, 1915, at the Grunewald Hotel.

DR. P. W. TROWBRIDGE, *Secy.*

North Carolina State Board

The next regular meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at nine o'clock on Monday morning, June 21st. Full information and application blanks may be secured by addressing the secretary.

DR. F. L. HUNT, *Secy.*,
Asheville, N. C.

National Dental Protective Association

The annual meeting of the National Dental Protective Association will be held in Washington, D. C., May 18th, 1915, at the Dental Department of George Washington University, at 7:30 P.M., for the election of trustees and transaction of business.

E. P. DAMERON, *Pres.*
M. F. FINLEY, *Secy.*

Northern Ohio Dental Association

The annual convention of the Northern Ohio Dental Association will be held in Cleveland, June 3, 4 and 5, 1915.

WESTON A. PRICE, *Pres.*
C. D. PECK, *Secy.*

Tennessee State Dental Association

The forty-eighth annual meeting of the Tennessee State Dental Association will be held at Sewanee, Tenn., June 24, 25 and 26, 1915. A fine meeting is assured.

C. O. RHEA, *Secy.*

Minnesota State Dental Association

The thirty-second annual convention of the Minnesota State Dental Association will be held in Minneapolis, June 11 and 12, 1915.

MAX E. ERNST, *Secy.*
St. Paul, Minn.

New Jersey State Dental Society

The forty-fifth annual convention of the New Jersey State Dental Society will be held at Asbury Park on July 21, 22, 23 and 24, 1915.

The headquarters will be located at the Coleman House. The ballroom will be used for all meetings of the society.

The glass-enclosed Casino over the ocean, just across the ocean drive from the Coleman House, has been secured for the exhibits and clinics. With over 2,000 more square feet of floor space than the pavilion used last year, there should be adequate room.

Dr. Chauncey F. Egel, of Westfield, N. J., is chairman of the exhibit committee, and reports that applications are already being made for space.

Dr. W. W. Hodges, of Perth Amboy, is arranging for an attractive list of clinics.

The essay committee, under the chairmanship of Dr. James I. Woolverton, of Trenton, will have three essayists of prominence to present.

A cordial invitation to attend is extended to all ethical practitioners.

John C. Forsyth, *Secy.*
430 E. State St., Trenton, N. J.

Ohio Valley Dental Society

The Ohio Valley Dental Society will hold a semi-annual meeting at Athens, Ohio, on April 14th, afternoon and evening. This will be the best meeting in the history of the society, and the program so far as can be announced at this date, is as follows:

Dr. L. E. Custer, Dayton, paper, "A New Jacket Crown." Dr. E. W. Martindale, Columbus, paper, "Pressure Anesthesia." Doctor Custer will clinic on subject of his paper; Dr. Robert Temple, of Columbus, clinic on "Pyorrhea;" Dr. D. Haight, of Coshocton, "Cheoplastic Manipulation of Vulcanite Rubber." Clinics also by Drs. E. E. Hall, Alden Bush and Edward C. Mills, of Columbus; Drs. W. G. Hamm, A. H. Gunther, P. F. Dixon and Chas. W. Mills, of Chillicothe.

A cordial invitation is extended to you to be with us and attend the banquet at our celebrated Hotel Berry in the evening.

J. S. Basom, *Pres.*,
W. S. Murray, *Secy.*

Interstate Association of Anesthetists

The Interstate Association of Anesthetists will hold its organization meeting in conjunction with the Ohio State Medical Association in Cincinnati, May 4 and 5, 1915, at which time an elaborate scientific program, devoted exclusively to recent advances in anesthesia and analgesia, will be presented.

Headquarters, assembly room and exhibits will be in the New Hotel Gibson, in which all the sections of the Ohio State Medical Association will also meet. An informal organization dinner will be served on the evening of May 4th, and later on the same evening the visiting anesthetists will be the guests at a smoker of the local entertainment committee, headed by Dr. E. O. Smith. Visiting ladies will be entertained by Dr. Nora Crotty and her committee at a reception and theater party.

Anesthetists, surgical and dental, as well as interested surgeons or practitioners who appreciate the value of knowing something about the recent advances in anesthesia and analgesia, are cordially invited to attend. For further information and dinner reservations, address

F. H. McMechan, M.D., *Secy.*
1044 Wesley Ave., Cincinnati, O.

Michigan State Board of Dental Examiners

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants who wish to practice dentistry in Michigan, will be held in the Dental College at Ann Arbor, beginning Monday, June 14, 1915, at 8:00 A.M., and continue through Saturday, June 19.

For application blanks and full information apply to

A. W. Haidle, *Secy.*
Negaunee, Michigan

South Carolina State Board of Dental Examiners

The next annual meeting of the South Carolina State Board of Dental Examiners will be held at Columbia, S. C., beginning at 9:00 A.M., Tuesday, June 15, 1915.

All applications must be in the hands of the secretary not later than June 5, 1915.

INSTRUCTIONS FOR APPLICANTS

The attention of applicants for license to practice dentistry in the State of South Carolina is respectfully called to the following rules and regulations:

I. All applications must be in the hands of the secretary ten(10) days before the meeting of the State Board of Dental Examiners.

II. Each application must be accompanied by a fee of $15.00.

III. Each application must be recommended by three ethical dentists from the applicant's home town or nearest towns.

IV. Each application must be accompanied by a photograph of the applicant on the back of which (photograph) must appear the signatures of the three dentists who recommend the application.

V. The minimum preliminary educational requirement is a State High School diploma or its equivalent—fourteen (14) units.

VI. Each applicant must present a diploma from a reputable dental college.

VII. The practical work in Operative Dentistry will consist of one gold foil filling, one silicate filling and one amalgam filling. Applicant to furnish instruments and material. Probably with an extraction and pulp removal.

VIII. The practical work in Prosthetic Dentistry will consist of full upper and lower set of vulcanite teeth articulated in wax. Applicant must furnish full upper and lower models on an articulator, also teeth and wax. The work to be done in the presence of the Board.

IX. The practical work in Crown and Bridge will consist of a four-tooth bridge from first bicuspid to second molar, inclusive. This bridge to be constructed in the presence of the Board of Examiners. Applicant will furnish articulated model, material and instruments. The Board of Examiners will furnish blow-pipe and investment material.

X. The theoretical examination will consist of written examination on all regular college branches.

Application blanks and instructions for applicants may be obtained by addressing R. L. Spencer, *Secy.*,
Bennettsville, S. C.

Wisconsin State Board of Dental Examiners

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at Marquette University, on June 21, 1915, at 2:00 P.M., for examination of applicants to practice in Wisconsin.

High school diploma, application and $25.00 fee to be filed with the secretary ten days prior to above date.

Dental diploma to be presented in advance of the examination.

Junior dental students presenting a clear card for two years' unconditional work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in the following six major subjects: Anatomy, Physiology, Histology, Chemistry, Bacteriology, Materia Medica. Satisfactory grades made in these subjects will be credited at subsequent examinations.

Special application blanks for this examination and $10.00 fee, together with high school credits, to be filed ten days in advance.

S. H. Chase, *Pres.*
W. T. Hardy, *Secy.*
404 Majestic Bldg., Milwaukee, Wis.

California Dental Quiz and Post Graduate Course

The California State Board holds examinations twice yearly, in June and in December. Our Quiz and Post Graduate Course is held during the seven weeks immediately preceding each examination.

Instruction is given by recitations, demonstrations, lectures and stereopticon in all subjects on which the Board examines, viz., anatomy, physiology, chemistry, metallurgy, pathology, oral surgery, dental materia medica and therapeutics, operative, prosthetics, orthodontia and histology.

The fee for the course, which includes everything, is $75.00.

Because of the large number of dentists who will be in California this year, many of whom have signified their intention to take the Quiz, we have decided to raise the tuition five dollars only. This fee of eighty dollars is payable in advance or during the first week of Quiz.

Next Quiz begins April 26, 1915.

Next examination will be held in Los Angeles about the third week in June, exact date not yet decided upon.

California does not reciprocate or interchange licenses with other states.

Each applicant must come prepared to perform any operation in prosthetic or operative dentistry that may be assigned to him. All work must be done in the presence of the Board. Applicants must furnish all necessary instruments, materials and patients. A complete set of rules and instructions governing the examinations will be given the applicants at the time of the examinations.

Bring your diploma and all state licenses you may hold.

A postal will bring you copies of recent examinations and any other information you may ask.

Address all communications to

A. HALDEN JONES, A.M., M.D.
222 Bradbury Bldg., Los Angeles, Cal.

Special Mail Course for Health Officers

Madison, Wis., March 2.—A correspondence course for health officers is announced by the University of Wisconsin, Extension Division. This course has been prepared to meet the need and desire frequently expressed for better preparation for local health administration. It is designed for health officers not able to pursue or warranted in taking residence work, as well as for others desiring to take up the study of health administration.

But few communities are prepared to employ on full time thoroughly trained sanitarians, according to the bulletin announcing the courses. Yet there is not a single community that does not need expert sanitary work in some direction. The topics treated in this course will cover laws and regulations, vital statistics and health surveys, transmission of disease, nuisances, and administration of a health department. The administration part of the course will treat of inspection work, visiting nursing, medical inspection of school children, quarantining, isolation and disinfection, use of laboratory, registration and other subjects.

Died

Mr. Oliver Lund, of Johnson and Lund, Philadelphia, Pa., died March 28th, in his eightieth year.

H. C. Leyden, of H. C. Leyden & Co., died March 29th.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

WHAT IS DOING IN THE SOCIETIES

Ohio—Richland-Ashland

Ashland, March 3.—Dr. I. W. Copeland of this city was elected president of the Richland and Ashland County Dental Association at the annual banquet and meeting at Mansfield last Wednesday evening. The other officers chosen were: W. E. Kennedy, of Shelby, vice-president; E. P. Jones, of Mansfield, recording secretary; G. W. Kenson, Mansfield, treasurer, and John H. Bristor, also of Mansfield, corresponding secretary.

Dr. F. H. Williams was elected director to the state dental association for a term of three years, under the new arrangement of electing members of the board of directors of the state association. C. S. Holbrook, of Shelby, and G. W. DeCamp, of Mansfield, were elected to honorary membership in the association.

Ohio—Clinic of Toledo Society

Dental science has shown marked interest in experiments with metals at the University of Michigan. Marcus L. Ward, D.D.Sc., who is directing the experiments, recited some of the developments before 85 banqueters of the Toledo Dental Society in the Commerce Club Friday night.

Sixteen clinics were held during the afternoon and 75 visiting dentists swelled the day's attendance to 200. An effort is being made to extend the field of these annual clinics to include Northwestern Ohio and Southern Michigan.

Indiana—Fort Wayne

Fort Wayne, March 9.—The first tri-annual meeting of the Isaac Knapp dental coterie held yesterday in this city proved a success. Sessions were held throughout the day. Those in attendance included the Fort Wayne dentists, with many members of the profession present from Indianapolis, points in northern Indiana and from Ohio.

The program was purely professional in character, being devoted to the discussion of those questions and problems which have marked the progress of dentistry.

The speakers were Edgar E. Quivy, of Fort Wayne; Dr. Frederick R. Henshaw, dean of the Indiana Dental College; Dr. Ernest D. Cofield, of Indianapolis; Dr. George E. Johnson, Fort Wayne; Dr. J. W. Thompson, Fort Wayne; Dr. S. T. Henderson, Fort Wayne, and Dr. George L. Johnson, Fort Wayne. The papers, lectures and clinics covered practically every department of dental work, prepared by experts, and as a crowning feature the program concluded with a visit to the Roentgen laboratory, where Doctor Henderson, of this city, demonstrated before an interested audience the latest methods of operating transformer in producing ordinary and stereoscopic radiographs and fluroscopic examinations, new discoveries of inestimable value to the profession. The tri-annual meeting closed with a banquet at the Anthony Hotel.

The principal post-prandial speaker was Harry H. Hilgemann, prosecuting attorney of Fort Wayne, who, taking for his subject, "Dental Jurisprudence," delighted his hearers with a discourse sparkling with wit and humor and containing many little flings which the dentists were quick to appreciate.

Michigan—Fifth District

Grand Rapids, Feb. 17.—Dr. Arend Vyn of Grand Haven, was advanced from the position of vice-president of the Fifth District Dental Society to that of president, succeeding Dr. R. L. Sexton, of this city, at the annual meeting of the society in the Association of Commerce building, today.

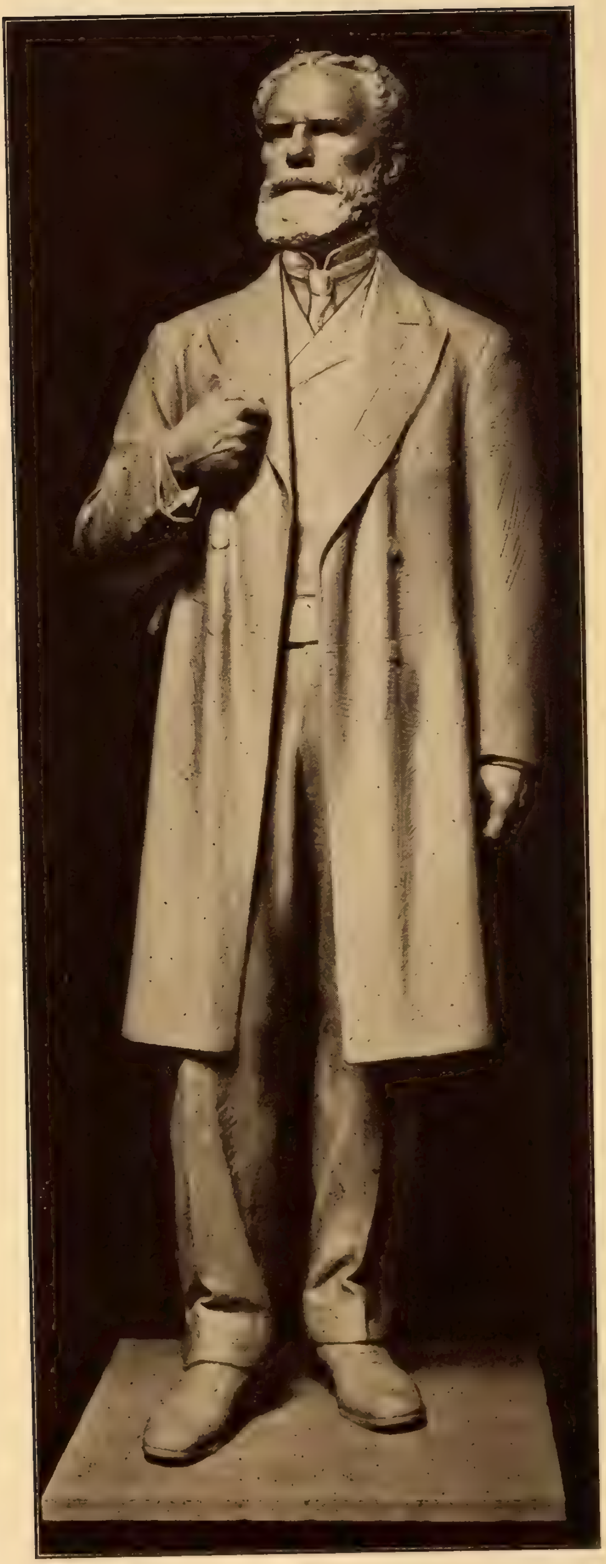
C. E. Hathaway, of Ionia, secretary, was elected vice-president, and R. A. Hornung, of Muskegon, treasurer, was elected secretary and treasurer. Irving D. Carpenter of this city, was elected honorary treasurer.

The afternoon session was devoted to a progressive clinic, with program as follows: "Local Anesthesia," Dr. C. J. Lyon, Jackson; "Anatomical Articulation," Dr. G. J. Shand, Kalamazoo; "Practical Office Hints for Every Dentist," Dr. C. J. Hildreth, Grand Rapids; "Construction of Anatomical Denture," I. J. Dresch, Toledo; address, Dr. James D. Locke, Grand Rapids.

The convention closed with a banquet in the Association building at 6:00 o'clock, at which Dr. R. W. Bunting of the University of Michigan spoke on "Analysis of Dentifrices."

Illinois—Will-Grundy County

Dr. J. P. Buckley of Chicago was the guest of honor at the annual banquet, February 23, at Joliet. After the banquet Doctor Buckley addressed the steel works club on "Bettering Health Conditions."



The
Willoughby D.
Miller
Memorial

To be
Unveiled in Columbus,
Ohio, at the next
Meeting of The Ohio
State Dental Society,
At Columbus in
December, 1915

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV MAY, 1915 No. 5

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
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L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

FRACTURES OF THE INFERIOR MAXILLA*

BY HENRY S. DUNNING, M.D., D.D.S., NEW YORK

DURING THE LAST EIGHT YEARS I have had quite an opportunity of studying fractures of the maxillary bones at the New York College of Dentistry. At the college we have a large daily oral surgery clinic under the direction of Prof. Faneuil D. Weisse and myself, which is fed by the outpatient department of nearly all of the large hospitals of Manhattan. Since the founding of the oral surgery clinic at the college in 1906, we have treated over 1,200 fractures of the inferior maxillary bone, but I am sorry to say that at this time I can present figures taken from only 1,065 cases, as some of the records are not very complete.

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*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

Stimson says, "By fracture, in the surgical sense, is meant the breaking of a bone or cartilage." The liability of a bone to fracture depends on its shape, size and degree of exposure to external violence or trauma, and also to its exposure to extreme muscular action. On account of its peculiar horseshoe shape, its prominence and its unsupported position, and the fact that it is somewhat weakened by the carrying of teeth that often become diseased, the inferior maxillary bone is the most frequently fractured bone of the face.

Stimson shows that in 14,566 fractures of all the bones of the body treated at the Hudson Street Hospital (1894-1905), 502 were fractures of the inferior maxilla. From his figures this bone is the tenth on the list as being most often fractured. Another reason for its frequency to fracture is its weakened condition because of physiologic absorption after teeth are extracted. Most fractures of the body of the bone proper, or of the rami, are complete fractures, and it is the complete fractures that will be discussed today.

TABLE 1.—INJURY AND CAUSES IN 1,065 CASES OF FRACTURE OF THE INFERIOR MAXILLA*

Injury and Causes	No.	Per Cent
Blow of fist	495	46.5
Run over by wagon	38	3.5
Elevator	14	1.5
Gunshot	5	0.5
Pathologic fracture	2	0.2
Extraction of teeth	5	0.5
Edentulous mouths	10	1
Miscellaneous	238	21
Kicks	45	4
Fall	140	13
Baseball Bat	13	1.5
Club	32	3
Thrown Ball	7	0.6
Railroad accidents	2	0.2
Blackjack	17	1.6
Cranking Machines	2	0.2

AGE		
From 1 to 10	68	6⅓
From 10 to 20	93	8.5
From 20 to 30	298	28
From 30 to 40	340	32
From 40 to 50	184	17
From 50 to 70	82	7.5
SEX		
Male	992	93
Female	73	7

*This and the following table comprise a report of 1,065 cases of fracture of the inferior maxilla treated at the New York college of Dentistry during the years 1906-1913, taken from the service of Faneuil D. Weisse, dean and professor of oral surgery, anatomy and surgical pathology.

Fracture of the alveolar process is very numerous and occurs often on the extraction of a tooth. Complete fractures of the body of the bone are generally vertical in direction, and about 98 per cent. of these fractures are compounded to the mouth, when there are teeth present. This is due to the fact that most of the fractures of the body of the bone occur at the alveolus of a tooth and run along the tooth cavity to its end, and then enter the body of the bone in the same direction. The fracture of this bone is the most often compound fracture of any in the body, owing to its thin covering of gum tissue and mucous membrane, and of course, for this reason, it is the most often infected fracture. It is not often compounded to the face. The vertical direction is also due to the fact that the bone is most often fractured by a blow that bends the bone at right angles to its long axis. A blow on one side of the jaw will sometimes cause a fracture on the opposite side in the same way that a blow on a barrel hoop will be felt at a point opposite the point where the blow is received. This is called "fracture by *coutre coup*."

In edentulous mouths the fractures are usually simple ones, and are not so apt to be vertical as there is no tooth cavity to weaken the bone, and to direct the line of fracture. These often become compound fractures, as the gum is so thin that pressure of an interdental splint often causes a sharp edge of bone to penetrate the soft tissue.

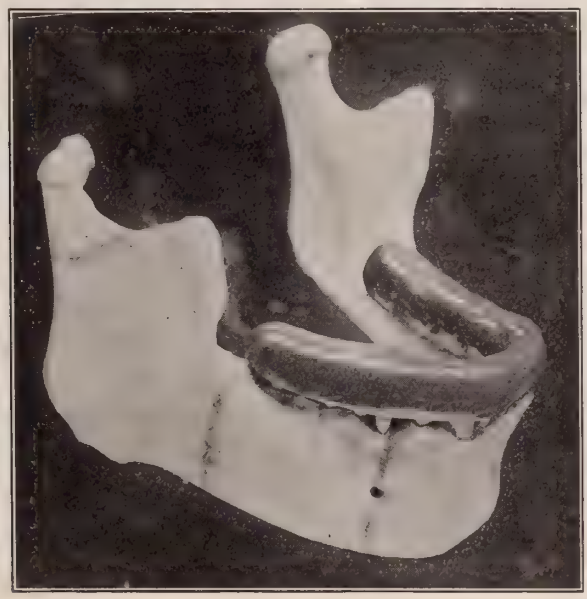

Fig. 1—Cap splint or single arch splint used whenever there are one or more sound teeth on either side of the line of fracture.

Fractures of the alveolar process are usually in the anterior part of the jaw, where they are more exposed to trauma.

Varieties of Fractures: 1, complete; 2, incomplete; 3, single; 4, multiple; 5, simple; 6, compound; 7, comminuted or splintered. Any of the foregoing fractures may be complicated when nerves, blood vessels and other structures are involved.

Symptoms of Fractures: 1, objective; 2, subjective.

Objective Symptoms: 1. Deformity. Fractured portions of bone in faulty position, malocclusion of teeth; swelling and edema of soft parts, enlargement of glands.

2. Abnormal mobility of the fractured parts of bone or false point of motion.

3. Crepitus. The grating of the fractured end of one bone on another, obtained in complete fractures by holding one fragment of bone firmly between the fingers and moving the other on it.

4. Increased salivation, or drooling, very marked as a rule, and patient is forced to expectorate continually, owing to reflex excitations of vasomotor nerve.

5. Hemorrhage and ecchymosis often present when the soft parts have been traumatized. The gums surrounding the point of fracture are often discolored and congested, owing to rupture of small capillaries, and extravasation of blood into the tissues.

6. Inability to close teeth together with much force on account of the lack of muscular control.

7. Teeth often loosened at point of fracture, and the teeth often fractured or chipped.

8. Infection and abscesses and necrosis at line of fracture.

Subjective Symptoms: 1. Pain in moving jaw when eating, swallowing, etc.

2. Pain and "soreness" of throat, due to absorption of toxic material by adenoid tissue of throat.

3. Inability to masticate.

4. Pain on pressure at point of fracture.

5. Difficulty in talking and swallowing.

6. Partial and complete anesthesia around point of fracture, due to injury of branches of the third division of the fifth nerve and followed sometimes by slight anesthesia of the tongue.

TABLE 2—NUMBER, KINDS AND LOCATIONS OF FRACTURES

	No.	Per Cent
Number of Fractures:		
Single	951	89
Double	108	10
Triple	5	0.5
Quadruple	1	0.1
Kinds of Fracture		
Simple	70	6.5
Compound	995	93.5
Location of Fracture		
Median line	69	6.5
Right Side		
Lateral region	112	10.5
Cuspid region	96	9
Bicuspid region	122	10.75
First molar region	86	8
Second molar region	123	10.75
Third molar region	66	6
Ramus	26	2.5
Condyle	3	0.6
Coronoid process	2	0.2
Left Side:		
Lateral region	65	6
Cuspid region	87	8
Bicuspid region	108	10.5
First molar region	94	9
Second molar region	144	13.5
Sedond molar region	144	13.5
Third molar region	70	6.5
Ramus	27	2.5
Condyle	2	0.2
Coronoid process	0	0

Causes of Fractures: 1. Predisposing causes. 2. Direct causes.

Under predisposing causes we have:

A. Age. Both extremes of age—the very young child and in the old person. Young children's jaws do not fracture as easily as do those of old people, because the bone is more cartilaginous and springy, owing to the fact that the bones are not completely calcified. Around the ages of 6 to 10 years they are often greatly weakened by the eruption of the second teeth. Spaces are present in the body of the bone to hold these large erupting teeth, and quite often one finds the line of fracture through these cavities. In old persons, of course, all bones are more brittle, more poorly nourished, and the maxilla is often greatly thinned by the absorption that has taken place after the teeth have been lost. The most common age for fracture is between the ages of 30 and 40 years. Men, during these ages, are more often exposed to trauma, as their activities are greater.

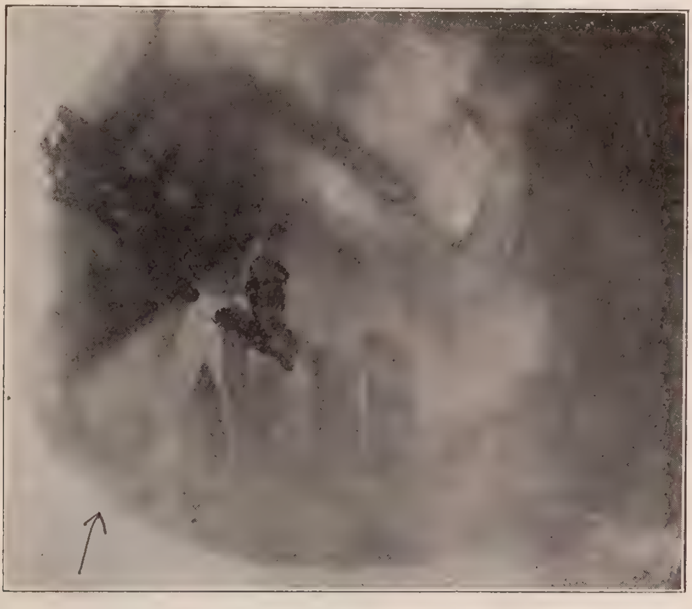

Fig. 2—Impacted cuspid in line of fracture; a predisposing cause and an obstacle to healthy repair of bone.

B. Disease is another predisposing cause of fracture. Under this heading we have spontaneous or pathologic fracture:

(*a*) Necrosis of bone caused by infection, osteomyelitis, arsenic poisoning and phosphorus poisoning.

(*b*) Syphilis of bone.

(*c*) Tuberculosis of bone.

(*d*) Cysts of various kinds, including dentigerous cysts, in which large cavities are formed in the bone.

(*e*) Osteomalacia.

(*f*) Rickets.

(*g*) Tumors, odontoma, sarcoma, osteosarcoma, etc.

C. Occupation is a predisposing cause. Drivers, longshoremen, chauffeurs, waiters, pugilists, etc.

D. Sex; about ten times as common in man as in woman.

Under direct causes:

A. Blows of fist most frequent.

B. Blows of clubs, etc., next.
C. Automobile accidents.
D. Elevator accidents.
E. Railroad accidents.
F. Gunshot cases.

G. In extracting teeth. A complete fracture of the inferior maxilla is caused very rarely by the extraction of teeth, and I can only count one or two cases in which the jaw has been actually fractured by careless extraction.

Location of Fractures: I do not agree with Stimson when he says that the most common seat of fracture of the lower jaw is at or near the median line (see tables).

Fractures at the *median line* show, as a rule, very little deformity as the parts are pulled on more evenly by the muscles on either side of the line of fracture. These fractures are not so common as in other regions of the jaw on account of the increased thickness at the symphysis.

The deformity at the *canine region* is not so marked as a rule, as the nearer to the median line the more even is the play of muscles, and the less deformity on this account.

The fracture at the *bicuspid region* often shows quite a marked deformity, the anterior fragment being drawn downward and backward, and the posterior fragment upward and outward.

Fractures between the first and second molar teeth may cause a good deal of deformity; generally the bone anterior to the fracture is depressed by the pull downward of the hyoid group of muscles. The posterior fragment is, as a rule, thrown upward by the contraction of the masseter and pterygoid muscles. The anterior fragment is also apt to be drawn backward, partly by the action of the hyoid muscles.

Fractures of the *ramus* itself do not show very much deformity, as the masseter and pterygoid muscles hold the fractured parts together as a rule. In these fractures the median line of the lower jaw does not coincide with the upper, as the whole lower jaw may be drawn over toward the fractured side if there is any over-riding of the fractured parts of the bone. It is caused usually by a blow on the side of the face.

Fractures of the *condyle* are not so rare as the figures would show, but are not often diagnosed even with the aid of the Roentgen ray. A straight blow on the chin, forcing the jaw backward, generally causes this fracture, and quite often causes fracture of the base of the skull, by fracturing through the glenoid cavity, and also fracturing into the external auditory meatus. There is often a marked swelling around the point, and bleeding from the ear. Pain on moving the jaw, and the drawing of the entire jaw over toward side of fracture. These fractures are often very serious, one case being reported by Christopher Heath of London. At necropsy it was found that the glenoid cavity had been fractured and the patient had died from a large brain abscess.

Fracture of the *coronoid process* is extremely rare, as the coronoid process is so nicely protected by the zygomatic arch and its contents. The entire side of the face is often crushed without injuring this part of the inferior maxilla. Some authorities assert that the coronoid process is fractured by the sudden contraction of the temporal muscle, but this has not been proved conclusively.

Fractures posterior to the *third molar* at the junction of the ramus and the body of the bone are quite numerous, and the fractures in these cases are often in an oblique direction. Displacements in these cases are not very marked, as the parts are held together by the masseter and internal pterygoid muscles.

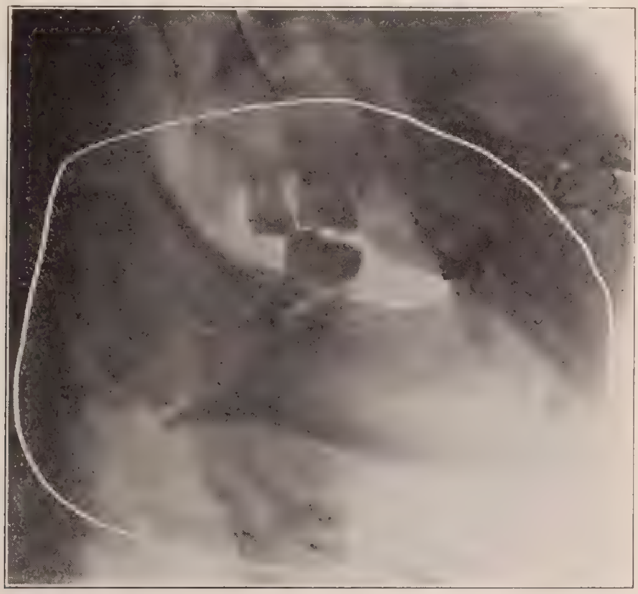

Fig. 3. Fracture of tooth and jaw; tooth becomes infected and must be removed.

Single and Multiple Fractures: Single fractures of the jaws are, of course, more common, but double fractures are frequently seen as shown by my tables. Triple fractures are quite rare and I have seen only four or five in the foregoing series. Quadruple fractures are extremely rare, and I have seen only one case. Teeth are often loosened and fractured in complete fractures of the bone. Multiple fractures are generally more painful, owing to the fact that there is usually more trauma, and the fractured ends of bone impinge in more than one place on the inferior dental nerve. In these cases, when trauma has been great there is often an area of anesthesia around or near the line of fracture. This condition often remains long after the jaw has united.

The location and number of fractures of the lower jaw depend a great deal on the articulation of the jaws, and to the arrangement of the occluding teeth. Also to the manner in which the trauma is produced. Slight dislocation of the bone often occurs when the bone has been fractured in more than one place, especially when the fractures are bilateral, as the shape of the bone is not supported and its arch collapses. By the play of the powerful hyoid muscles, the bone is then drawn downward and the condyles are often displaced slightly from the glenoid cavities.

TREATMENT

In treating fractures of the jaws the general hygienic condition of the mouth must be carefully considered and the general physical condition of the patient noted. The teeth should be cleansed first of all—not too minutely removing all calcareous deposits, but the soft food particles and infectious material should be removed from the teeth and soft parts. The gums and teeth should be cleaned every two hours by means of cotton swabs on a stick soaked in hydrogendioxid and water (equal parts). A Roentgenogram should now be taken. The next step should be the extraction of any broken-down decayed roots, and any loose teeth near the point of fracture. If these are not removed they often cause abscesses which are generally very troublesome. After the mouth is rendered as clean as possible, lacerations of gums and soft parts have been treated, and roots have been removed, the next important step is to consider the means of proper coaptation and fixation of the bony parts.

If there is very much edema and swelling of the soft tissues, it is sometimes well to apply hot or cold compresses, and wait until the swelling subsides, meanwhile keeping the mouth clean, and the jaws held together with a Barton bandage.

In taking up the matter of fixation of the bony parts, we must consider the mechanics of the case. We must think of what forces are going to act on the different parts of the bone, and how much strength it will require to hold the fractured parts together for a given time.

It is comparatively easy to immobilize a fractured leg or arm, but a different story to keep the inferior maxilla from moving. The inferior maxillary bone is moving continually. The powerful muscles of the jaws are pulling and contracting in different directions all the time. The fractured parts move every time the patient eats, swallows, coughs, talks, sneezes, etc., unless held by a well-constructed mechanical appliance. We must remember that the average splint will remain in the mouth about thirty days under more or less constant strain. These appliances should be strong, comfortable and as small as possible, and should be arranged so that the patient can chew with splint in position if possible. Of course, the articulation of the teeth should be carefully studied and the functions of jaw and teeth accurately restored as a final result.

In discussing the actual method of splinting fractured jaws it will be well to consider again the location of fractures.

In fractures of the *median line*, when there is not much deformity, and when there are one or more sound teeth on either side of fracture, the best method to adopt is the use of a cap splint or single arch splint made of rubber or metal. Wires or interdental splints should never be used in these cases, as they are clumsy and dirty, and the patient is unable to chew with them.

In fractures at the *molar region*, when there are one or more good teeth, the cap splint can be used, but if the teeth are not strong, wiring the entire lower jaw to the upper is a good procedure for about ten days, until there is partial union, and then the cap splint may be put on. When there is much deformity in this case, wiring the upper and lower jaw together, after applying Angle's bands, is a good plan. Mouths become very foul, and septic poisoning of the entire system may follow and also infection of the respiratory organs when the jaws are wired together for a long period. Carl Beck reports a case of inspiration pneumonia which ended fatally because of the filthy condition of a mouth resulting from the fracture of the inferior maxilla.

Fig. 4—Gunshot fracture; cap split in position.

Fractures *back of the third molar*, and in the ramus are best treated by interdental splints, and wiring jaws with Angle's wires. The wiring method is the best if there is much deformity, as sometimes it is difficult to force a jaw into an interdental splint and hold it there with a bandage, especially if the deformity is marked.

I disagree with Frederick J. Cotton when he advises the open operation and surgical wiring of fractures in this region. It is in most cases unnecessary. It is of course impossible to hold the ramus by any splint in the mouth, but the anterior fractured end of bone can be held to the ramus by wiring the upper and lower jaws together. In children all fractures are best treated by small modified interdental splints. The teeth are not strong enough to wire and it is difficult and unsatisfactory to cement a cap splint on the teeth.

Surgically wiring through the body of the bone for fractures in any location should not be done. Very poor results are obtained by this method, as most cases terminate in infection and necrosis. We have not had to resort to this treatment in over 1,200 cases.

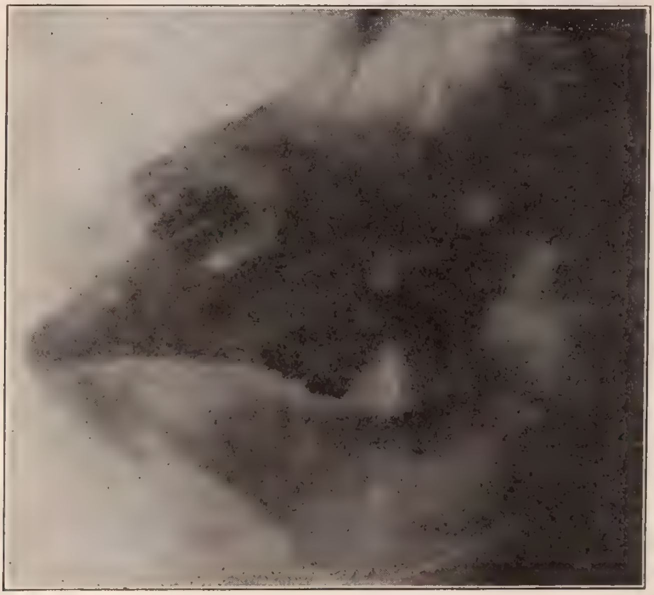

Fig. 5—Pathologic fracture; no history of any trauma, but long history of chronic abscesses of jaw. Fracture occurred while patient was eating crust of bread.

A method lately used has been the screwing of a Lane plate to the under border of the jaw and good results have been obtained, but this method is unnecessary. Outside splints or apparatus on the face are seldom needed and have not been used at all by us in over 1,000 cases treated at the college.

COMPLICATIONS

Infection is the chief source of annoyance and danger in fracture cases. A large percentage of all compound fractures are infected, and in many of these cases there is necrosis later. Abscesses often form at the point of fracture, and later sinuses form which are apt to break on the face owing to the fact that the pus gravitates downward. Comminuted or splintered fractures are nearly always followed by abscesses and necrosis

Union in these infected cases is generally delayed, and suppurating sinuses may continue for months. A good deal of necrotic bone in these cases is eventually thrown off.

Deep abscesses of the neck are often dangerous, and may extend along the deep fascia into the anterior mediastinum. Edema of the glottis may follow and fatal results occur. Ludwig's angina sometimes results.

Faulty union is quite often encountered, often in children when the bones sometimes unite before one can get on a suitable appliance.

Partial and complete ankylosis often occurs in fracture of the condyles, resulting in loss of function and malocclusion.

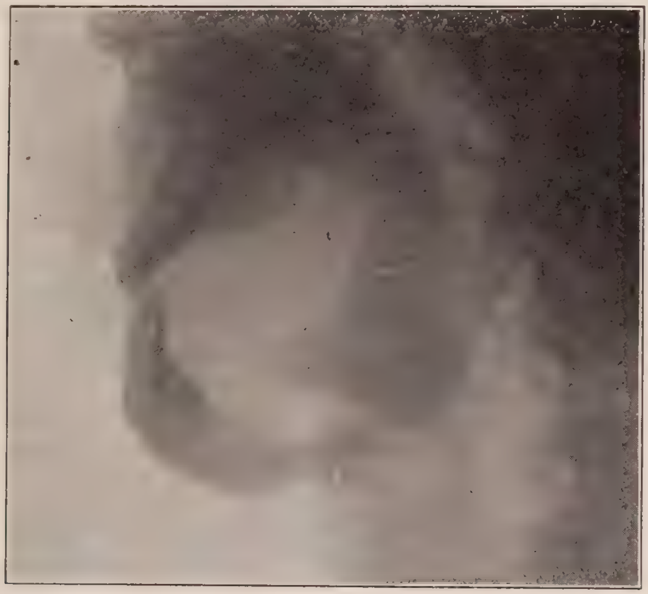

Fig. 6—Double fracture which was badly infected; shows marked loss of bone because of exfoliation; poor result obtained.

Non-union or pseudarthrosis occurs infrequently, generally owing to loss of bone following comminution after infection and necrosis, and perhaps aided by some constitutional disease such as syphilis, tuberculosis, etc.

We have had two cases of failure to unite in the foregoing series of 1,065 cases. This condition is also due to fibrous tissue and torn ends of periosteum coming between the edges of the bone and not allowing them to unite. Dr. Walter C. Cramp[1] in 1911 reported a case of rupture of the facial artery due to the fracture of the inferior maxilla. This is a very rare occurrence and I believe the only one on record.

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[1] Cramp, Walter C.: Fracture of Inferior Maxilla Complicated by Complete Division of Facial Artery, Med. Rec., New York, Sept. 2, 1911.

Salivary fistula may sometimes result as a sequence to fracture of the lower jaw, but this condition is extremely uncommon and does not occur unless the soft parts are greatly traumatized.

The diet of patients being treated for fractured jaws and wearing splints is one of a good deal of study and experimentation. It varies a great deal with the individual. My general method is to give the patient as many raw eggs (from four to six) per day and as much milk as possible (from one to two quarts), and feed every two hours. The diet ought to be carefully worked out for each patient, and the bowels, of course, must be kept open daily by means of efficient laxatives. Patients that have been wired by the Angle method for a month will often lose from 15 to 20 pounds. This, of course, is very weakening and one reason why the Angle wires and bands should not be used if other methods will suffice.

CONCLUSIONS

The inferior maxillary bone on account of its position and shape is the most frequently fractured bone of the face and about tenth on the list of all bones of the body to be fractured. About 98 per cent. of all fractures of the body of the bone are compounded when there are teeth present. And thus it is the most frequent bone to suffer a compound fracture. The fracture of this bone becomes infected on account of the fractures being compound, more than any other bone. The patient suffers great pain from injury to the inferior dental nerve and also from the inability to swallow, eat, drink and cough.

The fracture is about ten times as common in man as in woman. The most common age for the fracture of the bone is between 30 and 40. The most frequent cause of the fracture is a blow of the naked fist. A line of fracture is most often at the region of the bicuspids on the left side. Fractures of the lower jaw depend a great deal on the occlusion of the upper and lower teeth. Fractures of the condyles are rare, but are often followed by bony ankylosis. Fractures of the coronoid process are extremely rare and occur only when the zygomatic arch and the side of the face are severely crushed. Great care should be exercised in keeping the mouth clean in the treatment of fractures of the jaw. A cap splint or single arch splint should be used whenever there are one or more strong teeth on either side of the line of fracture to which the splint may be cemented. The interdental splint or intermaxillary splint should be used only in children, in edentulous mouths and in fractures posterior to the third molar when the upper and lower jaws cannot be wired together by means of Angle's wires and bands.

The open operation or surgical wiring of the fractured ends of the bone is unnecessary and generally results in infection and necrosis. The inferior maxillary bone can be more accurately reduced and held in better coaptation than other bones, as direct force can be applied to it by means of appliances attached to the teeth. Non-union very rarely occurs and is generally due to faulty or delayed treatment.

A Roentgenogram should always be taken to ascertain the line of fracture, to discover the presence of impacted teeth and to note any infections or abscess conditions at the apices of the teeth near the point of fracture.

ABSTRACT OF DISCUSSION

Dr. G. V. I. Brown, Milwaukee, Wis.: I wish Dr. Dunning would elaborate a little on a few matters which are sometimes disturbing to people who see fractures only once in a while. That is, the way he meets the conditions of the patient at the time of arrival at the hospital, or at least when called in an emergency. Dr. Dunning spoke casually of the treatment of these cases, but some, I think, require a little more treatment than he described. I find it necessary sometimes to make a temporary splint to give comfort, and I have made it quickly and rapidly out of a modeling compound. It is easily held in position by the use of the Barton bandage and will make the patient comfortable for a sufficient period of time, if necessary, to make it possible to do other work. When a man is thrown from an automobile he usually receives some other injury besides fractures and most of the time those are the things that give us most trouble. So that it is necessary sometimes to take care of cases through a critical period before he can adjust the fractures. I know that in his experience with 1,065 cases Dr. Dunning's observations would be valuable. I would ask him to speak about the manner of adjustment in these cases. I agree with him that, most of the time, a fracture of the condyle will adjust itself, if the rest of the jaw is held, with much less trouble than we can adjust it by wiring. There are conditions, however, due sometimes to the shape of the fracture and degree of the angle of the fracture, that should modify this statement. Because one case adjusts itself nicely without being held and without wiring, it would not necessarily follow that other cases, in almost the same situation perhaps, would do the same, because the angle of the fracture has to do with that. I think we agree that too much is done in fractures of the jaw. The less we do for them after using an appliance which will permit of constant surveillance, as far as possible, and give mobilization, the better. Unfortunately, too much is done in the way of cutting in and wiring the jaw. I do not believe in temporizing at all in the cases of a jaw that requires wiring, but I agree with Dr. Dunning that many are wired which should not be. Then again comes in as a part of this question, the manner of adjusting the wires, etc. We should understand the advantage of all methods which have been found most frequently successful.

Dr. M. I. Schamberg, New York: Dr. Dunning's statistics are intensely interesting, and I am sure that his experience in these cases, when we read them over carefully in his paper, should help us materially, particularly those of us who see far fewer cases. I have seen a large variety, but in no sense a large number. I have found, as has Dr. Dunning, the Roentgen ray intensely valuable, and in fact almost essential to absolute accuracy in most of these cases, for the reason that so frequently one will see fractures with spiculae of necrosed bone, or infection, or at times portions of the root, and in one instance both spiculae of bone and a piece of the root protruding into the fractured region, which would retard the healing. Another case to which I refer was a pathologic fracture of marked extent in which the Roentgen ray showed what looked like a compound comminuted fracture of a jaw that was ordinarily thick. I was inclined to suspect that this was produced primarily by arsenic necrosis, and this necrosed bone in the jaw was separated in many places. We dealt with this case in a manner that would not appear to you to be surgically correct, but by which the case culminated satisfactorily. All that appeared to be bone was nothing but a thin matrix and this acted as a matrix for new bone to form. The jaw was splinted on each side, and this patient wore the splint at an old age, resulting in the reduction of the fracture and the formation of a very useful jaw. The splint was removed after the patient wore it for six months and the result on that side is wonderful. I have a similar case in which there was extensive necrosis of the jaw and in which, after a similar appliance was worn, complete regeneration of the bone took place. I believe that much can be done by the application of what may be termed surgical prosthesis without real surgery, to bring about results that heretofore have not been achieved.

Dr. Theodor Blum, New York: This appliance which Dr. Schamberg has spoken of is really not a splint in the ordinary sense of the word, but is the splinting of the jaws by means of a sliding joint. One point with regard to fractures is the splinting of the lower jaw to maintain its mobility, and the same principle is carried out in these pathologic fractures in a different way. At the University of Pennsylvania we were taught by Dr. White that there were three points to be remembered in the treatment of fractures. First, reduce the fracture; second, maintain mobilization of the joint on either side of the fracture, and third, maintain nutrition.

Dr. W. Wayne Babcock, Philadelphia: Anyone who has gone to the trouble that Dr. Dunning has in collecting the data on such a large series of cases as this, nearly eleven hundred, every one of a single bone, is deserving of great credit, because it clarifies our knowledge with regard to certain points which have been in dispute and confirms things which may have previously needed confirming. We are practically agreed as to the plan of treatment; as to the advantage of getting away from some of the older appliances, especially the interdental splint, and relying on operative intervention. Nature has already done about the worst she could do in the accident, and then it has been the tendency for the surgeon to step in and further traumatize the parts, and it is not surprising that necrosis and various ill results have followed. Then again, in these cases sometimes the question arises as to the external wound. In most cases we are safe in cleansing and closing any external wound on the face. If the fracture is compound, let it be compound in the mouth and not from the face; and if one has been careful, as a rule, I believe the face would heal and drainage will take place in the mouth and to the same degree. Then as regards teeth that are somewhat loosened adjacent to the fracture, as a rule, I believe, Dr. Dunning feels that these may be left at the time to see what the results will be. Frequently teeth which look as though they must be sacrificed, if followed up, gradually become fixed; and of course, later on, spiculae of bone or any tooth that has become loosened may be removed at a time when the deformity may not be so great, or at a time when the removal may not bring about a greater deformity.

Dr. Henry S. Dunning, New York: I agree with Dr. Brown that a great many of these patients need attention other than that pertaining to the jaws. For instance, in one case, a woman was hit by a taxicab and among her injuries was the fracture of the jaw. This patient was unconscious when picked up and was suffering from a fractured rib and arm and concussion of the brain. This brings out a point in the paper that many fractures of the condyle are accompanied by fracture at the base of the skull, or fracture of the posterior wall of the glenoid cavity. I think Dr. Beck reports a case in which the patient died from abscess of the brain, due to a blow on the chin causing fracture of the base of the skull. I treat a great many of these cases in the hospital when the patient has received other injuries and has sometimes brain symptoms. I think the reason why the "knock-out-blow" on the point of the chin is so famous is because the shock is so severe in a region that is close to the brain. The condyles are forced into the glenoid fossa, and being wedge-shaped, often cause a fracture into the cranium. With regard to surgical wiring, I have seen only one or two cases in over twelve hundred in which wiring had to be resorted to. Will Dr. Schamberg, who has had so much experience in the use of the Roentgen ray, say what angle is best from which to obtain a good Roentgenogram of the condyle? In one case nineteen Roentgenograms were taken of the fracture, and the one shown was the best we could get and the patient was put in every conceivable position to get that. In most of the other Roentgenograms we had the vertebrae overlapping the condyle.

How does Dr. Blum keep the two ends of the bone in apposition and allow the patient movement of the jaw at the same time, in fractures posterior to the third molar? I believe that it is poor treatment to wire the upper and lower jaws together when any other appliance can be used that will permit the patient to use the jaw while being treated. I never do it unless the fracture is posterior to the third molar, or for some reason the teeth in the mouth cannot hold a splint to advantage. It is difficult often to keep the mouth clean when wired. Dr. Beck reports a case of inspiration pneumonia from a filthy mouth, wired for some weeks after a fracture, in which the mouth could not be kept clean, and in this case the patient died. I agree with Dr. Babcock that if we can possibly close the external wound, we should do so. Of course these wounds are mostly dirty or infected wounds and must often be drained. I think it is best to close these wounds partially, as soon as possible, but to leave one end open for a few days and allow it to drain and then later to fill in with granulations.

OFFICE CREDITS AND HOW TO CONTROL THEM*

BY DOCTOR McVEA

THERE IS NO SUBJECT TODAY which is of more importance to the dentist than that of credits. Why should we allow ourselves to go unpaid for the hard and conscientious work which we have done, or take the cash from our pockets to purchase gold and other precious metals, any more than any other class of business men?

I do not claim it is the entire fault of the dentist himself, but I do say that he is in a great measure to blame for this loss in his office practice.

The reason for this is that the dentist is a poor collector and never looks at it from the same standpoint that the banker does. Now borrow from your banker and see what is his first aim; you pay the interest first on all loans before there are any loans made. I wish here to tell you a little story to illustrate my point. An old darkey went into a bank to borrow $10.00 for one month, and when he asked Marse John, the banker, for the loan, the banker asked him to get Mr. Brown, his merchant, to endorse the note for him. Old Sam came back to the bank for the money, and when the banker handed him $9.00 from the window, the old negro counted it over and over and then shook his head. "What's wrong," said the banker; "what's the trouble?" "Nothing wrong, Boss, I guess; I was only thinkin' dat if I had borrowed dat $10.00 for ten months, I wouldn't hab a cent of dat money coming to me."

Now, why should we not establish the same method used by our bankers, and secure a deposit on all work before it is really done? But this is a minor part of the entire transaction; we should first ask many questions of our patrons whom we do not know, ask who sent them to us, about their business, their friends, etc., and it would be well always to ask them for reference if we do not know them personally, and should by all means keep this reference on our books; in fact we should always have a financial rating to refer to for future reference or in case some member of our fraternity should ask us about them.

I believe the system that the business men of Texas have established in their state is as perfect a system as could be inaugurated. The Business Men's Protective Association or the Retail Merchants' Association has established this form of credit rating in nearly every town of their state and it has proven one of the best assets the business men have in their trade today.

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*Read before the Louisiana State Dental Society, 1914.

The business men of the town are solicited by a committee of their fellow merchants, and asked to meet at some place to take up a plan to check credit habits and their abuse by men and women who are using them the most to get what they want and are not able or willing to pay. These men generally meet and appoint a president and four directors; the directors select a secretary and pay him to devote his entire time or part of his time to carry out this work; they assess their members for dues per month according to their financial standing or their business conditions. Doctors, dentists and all professional men are generally assessed one dollar or two dollars per month. The secretary then gives a blank form to each merchant, which he gets from the state secretary, and has each merchant fill out and rate his own patrons as they stand with him. Every man on their books is rated, those paying cash are rated C, those paying promptly are rated P, those who are good pay are rated G, those who pay slow S, those who pay very slow V, those who don't pay XX. You will note there is no necessity to worry about C and P's rating. G is a man who will pay you at the end of each month; S is a man who will pay you when he can, always take his note; V is the man who pays very slow—require cash or do not sell him; X is N.G.—require cash for everything; in other words he is a deadbeat.

These ratings are always returned to the secretary, also with a statement from the merchant of any credit outstanding against any party. These are also recorded on his card in the file cabinet.

Members must be frank and candid with each other in giving this information to the secretary, as he, the secretary, is the only man who ever knows who this man owes. For instance, should a member wish to know how Mr. A. Jones stands, he phones the secretary's office and asks for a rating on Mr. A. Jones. The secretary draws this man's card from the file and reports that Mr. A. Jones is reported by five merchants as very good, two report him owing them, one he owes $20.00, the other $10.00, and has been owing these accounts for several months; another reports him N.G.

How is the dentist to handle this man? It is often handled in this way: the dentist will say to Mr. Jones, "I would like to credit you, but I am a member of the Retail Merchants' Association, and I find that you are not reported favorably, as to paying your obligations promptly; how do I know that you will not make me wait a long time for this money?"

Mr. Jones immediately recognizes that he is in bad with the business men of the town; sometimes he gets mad but this does not help his case a bit. Did you ever see a man get angry with the bank for refusing to lend him money, and did it make any difference to the bank if he did? When this man finds he is up against a business men's organization he begins to be a good citizen.

A woman who will give a lady friend as reference hates to have her friend know her financial standing unless it is of the very best, and will usually pay her bills.

In many towns in Texas you will find men who have moved to a new location. Such men will go at once to the local secretary and report to him and ask him to write to Mr. So-and-so at Jackson, where he resided, in regard to his standing saying, "These men are all merchants I have been trading with and they will give you my true standing." The secretary writes at once for information, but if any of the merchants are in a hurry the long-distance phone is brought into action, or the telegraph lines, the merchant paying for the service. All answers come to the secretary and are at once filed, for the benefit of other members.

These associations are affiliated with the State and the State with the National Association, and the secretary pays from the dues of the members $1.00 for each member to the two organizations per year, 75 cents to the State and 25 cents to the National Association. The result is that you can get ratings on anyone in the U.S. by securing such information as to where the parties came from and their occupation. These funds also keep a state secretary in the field to organize the towns in the state, and run a trade paper to boost the towns and State. The State organization also furnishes forms and blanks to the secretaries for use in the work.

These associations are exactly like Bradstreet, Dun's and the Bankers' Association in their workings, only they go further into the affairs of smaller creditors, and often exchange information with them.

The trouble with most of our business men as well as our dentists and professional men, is *jealousy and lack of co-operation* among them for their own protection. It should be their aim to help and uphold each other in business and to weed out these dead beats regardless of prejudice, even though they were your patrons some time ago. You are just Christians enough to wish your opponent would get stuck. *We should assist* in making the standard of credits for the benefit of all, and vice versa.

We have found that in the small towns of, say, 5,000 inhabitants, where these organizations are established, there has been a saving of from $10,000 to $20,000 each year to the business men, and this money goes into legitimate channels of trade, and they are far better and prosper more, when once they understand it.

Credit kills friendship as well as business, and we all suffer in the end. Remember this: my advice to all dentists is, Co-operation. We can have our own system; let's make a rating of every man who comes to our office, ask questions, ask for reference, and ask for his note when necessary to show him the banker's way of doing business, and it is our duty to exchange these ratings with any brother in our profession, and he to do the same by us.

ZONETHERAPY*

BY WM. H. FITZ GERALD, M.D., HARTFORD, CONNECTICUT

IN THIS PAPER we have attempted to condense our illustrated talks before the Connecticut and New Jersey State Dental Associations and shall discuss only that part of the subject that will most interest the dentist.

In zonetherapy we divide the body longitudinally into ten zones, five on each side and including the median line. The first, second, third, fourth and fifth zones begin in the toes and end in the thumbs and fingers, or vice versa. The first zone extends from the great toe up the entire height of the body from front to back, across chest and back (illustrations 2 and 3) and down arm into thumb or vice versa. Pain in any part of the first zone may be treated and overcome temporarily at least (and often permanently) by pressure on the first joint of great toe, or corresponding joint of thumb. Should the pressure be limited to the upper surface of the great toe the anesthetic or analgesic effect will extend up the front of the body to fronto-parietal suture, also across chest and down anterior surface of first zone of arm and thumb, and often the thumb side of index finger. (Fig. 3.) Should pressure be made on the under surface of the great toe the effect will extend along the first zone in sole of foot and up back of leg, thigh, body and head in that zone to above named suture, also across back and down posterior surface of first zone of arm and thumb, and often thumb side of index finger. (Fig. 3.) Pressure on end of great toe or tip of thumb will control entire first zone. Lateral pressure on thumb and fingers or toes will affect lateral boundaries of zones. A limited amount of anesthesia may be established by pressure over any resistant bony surface in this zone and often the mere momentary contact with the galvano cautery or pressures with a sharp-pointed applicator or with the thumb nail will produce the same result. Pain anywhere in this zone may be overcome more quickly by pressure with applicator or with cautery contacts at certain points throughout first zone in mouth, pharynx, epipharynx and nose, but the finger and toe pressures may be relied upon very often and what applies to one zone applies to all. Pressures average from one-half minute to four minutes, depending upon the susceptibility of the patient. Thumb-nail pressure accomplishes as much in less than half the time. If, for example, your patient has pain in the first zone on the left side of jaw (upper or lower) it is overcome, temporarily at least, by firm pressure on great toe or thumb. The patient may exert this pressure himself but the operator or an assistant will do it more expeditiously. This pressure may have anesthetized the incisor region sufficiently for painless extraction of incisor and cuspid teeth (left). However, it is usually necessary to supplement this pressure, for operative interference, by pressure on lips and at various points on jaws. The first, thumb or great toe zone (left for instance), usually includes the left incisors and cuspid tooth. Occasionally the second zone includes the cuspid tooth. The second zone, as a rule, includes but the bicuspid teeth. The third zone includes the first two molars and the inner side of the fourth zone the third molar. Pressure with the thumb or index finger or cautery contacts on upper or lower jaws in any of these zones will relieve pain in any part of an individual zone. Pressure or cautery contacts on anterior surface of jaws control anterior sections of zones one, two, three and four, and pressures or cautery contacts on posterior surface

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*Read before the Ohio State Dental Society by Dr. L. L. Barber, Toledo, O.

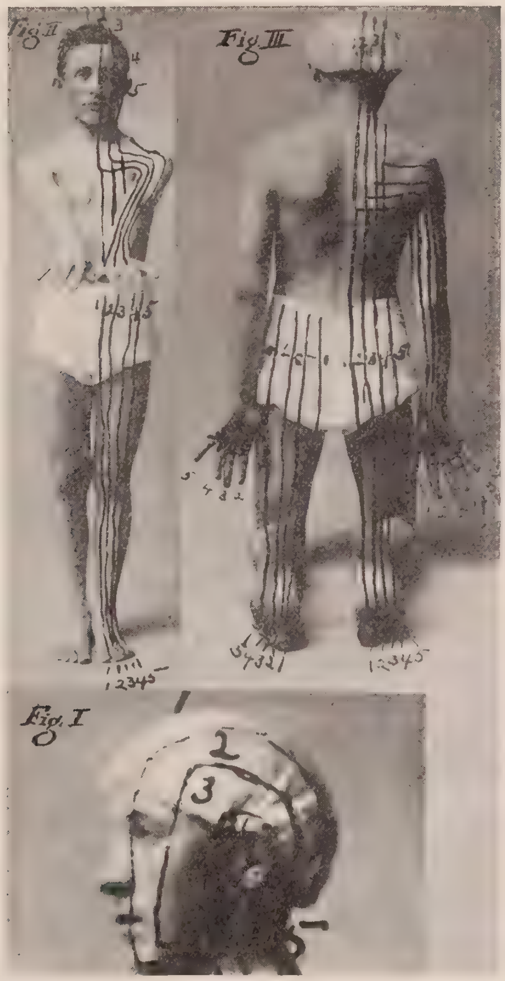

Fig. 3. Posterior view illustrating individual zones. It will be observed that what is commonly called the back of the hand is really the front of that member, whereas the palm of hand corresponds to sole of foot.

of jaws, control posterior sections of above zones. Pressure with the thumb or finger on inferior dental and lingual nerves at inferior dental foramen, will anesthetize that half of the jaw, and to a greater or less extent, the entire half of the body on side compressed, and because of the anastomosis of nerves at median line of the jaw, this pressure occasionally causes an anesthesia of a part or even the whole of the opposite side of jaw, but this is the only instance thus far noticed where anesthesia through pressure crosses the median line of body.

We are repeatedly called upon for the theory of zonetherapy. Most theories are interesting but not conclusive and rather than be obliged to retract theories we are not going to attempt to advance them (except very superficially) at the expense of clinical facts, at least not in this paper. It is possible that certain control centers in the medulla are stimulated, as has been suggested, but I believe that it is shock more often than stimulation. Some theorist has pointed out, perhaps rightly, "these functions may be carried out by the pituitary body through the multiple nerve paths from it."

We know that we induce a state of inhibition throughout the zone where pressure is brought to bear. We are certain that lymphatic relaxation follows pressure and the theory advanced by Doctor Bowers, "that inasmuch as there are admittedly ultra-microscopic bacteria, it is more than likely that in the light of this work there are ultra-microscopic connections analogous to those we call nerves."

Let the physician or the dentist who ascribes these phenomena to suggestion, attempt to relieve an aching incisor (left side) by pressing the little finger of the left hand of his patient, for instance, or exercise his persuasive powers on a throbbing molar by pressing the thumb. He will find himself up against a stone wall so far as results are concerned, for only by exerting pressure on the proper zone will the pain disappear. Anticipating such contentions we have purposely refrained in hundreds of instances from suggesting that we were even contemplating the relief of pain and the first and only suggestions have been from the patient, for example: "Doctor, I certainly experienced much pain in jaw, eye, small of back, knee, foot or shoulder, etc., before you pressed my fingers or used pressure in my mouth, but where has the pain gone? Have you done anything to relieve it?" etc.

What concerns and interests you most as dentists, is the possibility of demonstrating on practically every one of your patients the connection between the toes and fingers and the teeth. This establishes the incontrovertible fact that the medical and dental fraternities must work together if we are to accomplish all that it is possible to accomplish in combating disease, for it clearly demonstrates that foci of infection, however minute, in the mouth, may be responsible for pathological changes in practically every section of the body. Pathological conditions from mere irritation in nose, epi-pharynx, pharynx, mouth, throat, vagina, rectum, etc., may be responsible for not only annoying local manifestation but obscure pathological changes in most remote sections of the body and their course can usually be traced through an individual zone. There is not an existing pathological condition that cannot at least be relieved, and a large proportion can be cured through what we may some day call "shock anesthesia." We have never suggested this work as a panacea but finding it helpful in the treatment of human ills we consider it an asset to our knowledge of medicine and surgery, and have been glad to offer it gratuitously to physicians and dentists to make whatever use they will of it in the practice of their professions.

SOME EFFECTS WE ARE CERTAIN OF IN ZONETHERAPY

First: Analgesia in the majority of cases over all parts of the body, from pressures or cautery contacts in mouth, pharynx, epi-pharynx and nose and analgesia in a large percentage of cases over the entire body from pressure or cautery contacts on extremities.

Second: Anesthesia of jaws in the majority of cases from direct pressure on jaws and anesthesia of jaws sufficient for operative interference in a fair percentage of cases from pressure on extremities.

Many dentists have written me stating that they have been successful in establishing anesthesia through pressure in at least fifty per cent. of their cases. Patience and perseverance and the observance of a few general instructions will enable them to improve their technic and their success will correspondingly increase.

Those who have not been successful, perhaps because of lack of perseverance, or who have not even attempted to anesthetize through pressure, being influenced and strengthened in their skepticism by individuals interested in the sale of apparatus for the administration of anesthetics, would better get to work and convince themselves that pressure anesthesia has come to stay.

There will be no soreness or lameness of jaws due to this form of anesthesia following operations if instructions are followed.

While we are certain that zone anesthesia has come to stay and will become a most popular method, being applicable to all forms of dentistry, we do not believe that any form of anesthesia will corner the market. When humanity generally understands it and when the physician or dentist clearly sees the necessity for health's sake, of keeping the jaws in first-class order at all times, the demand for anesthesia of every variety is certain to increase. Zonetherapy will teach the physician to examine the teeth carefully, even before he looks at the tongue of his patient. Zonetherapy gives medicine and dentistry a status that the microscope does not.

Experience is the name we give to our mistakes.

MY EXPERIENCE WITH BROMURAL IN DENTISTRY

BY J. W. ROTH, D.D.S., RED HILL, PA.

Two years ago I introduced bromural in my practice and have had most excellent results with this preparation in such cases where sedative effects were desired. I administer this preparation in 5 to 15 gr. doses (1 to 3 tablets), regulating the dose according to the severity of the case and the vitality of the patient. I find bromural a very good nerve sedative in 5 and 10 gr. doses, and as a mild hypnotic in 10 and 15 gr. doses. In all cases in which I employed this drug I had no complaints of stupefaction or any other after-effect whatsoever. In preparing nervous patients for the operating chair I find the administration of bromural as a sedative greatly reduces anxiety. It may not eliminate the pain inflicted by dental instruments, but patients become more indifferent to pain and thus painful operations are not nearly as much dreaded by nervous patients and at the same time such operations are not as trying to the operator.

Bromural creates refreshing sleep with no ill after-effects. To patients who have had a long sitting in the operating chair, it should be administered twenty to thirty minutes before retiring. Bromural is a safe valerian preparation manufactured in two forms: in powder and in 5 gr. tablets. I find the tablets most suitable for dental use; they should be taken in some liquid (preferably luke-warm water or milk) in which they readily disintegrate.

STERILIZING THE AREA OF INJECTION

BY N. L. BURKE, EXODONTIST, GRAND RAPIDS, MICH.

The discussion of Doctor Blum's paper brought out a point upon which I spent some time—sterilizing the area of injection.

I first swab the area with vaseline, wiping dry. Then massage with a tightly rolled pledget of cotton, saturated with aconite and iodin, for ten or fifteen seconds. Apply compressed air and make another application of iodin and aconite.

Now apply collodion, covering one-half inch space. The application of collodion inhibits any movement of bacteria. Through the collodion film the ejection is made. This method absolutely prevents any infection being carried into the tissues. The needle passing through the film also receives a mechanical cleaning, as the collodion, fitting closely around the needle, wipes it dry. Upon withdrawing of needle the puncture is immediately closed by the mechanical action of the collodion. I have used this method for a long time and get absolute protection and perfect results.

My attention was called to conductive anesthesia of the mandible in 1904 by an osteopathic M.D., who stopped aching pains in molars by passing a ball instrument down and opposite mandibular space and exerting pressure for a time. I took advantage of this topical procedure and later purchased some long needles and used the injection method. Used one-half of one per cent. cocain in normal salt solution, and never had any bad results with the injection. In my work I am using conductive anesthesia on a par with nitrous oxid and oxygen, but it is a hard proposition to get the general practitioner to even try the procedure.

Metz Building.

THE DENTAL SOCIETY*

BY DR. F. A. KELLER, GARYVILLE, LA.

THE DENTAL COLLEGE, the Dental Journal and the Dental Society form the tripod upon which is based the progress of dentistry. Before the coming of these, dentistry was in a lowly position; its practitioners were uneducated persons who performed the duties of the dentist as a side line to their regular vocation. Barbers, jewelers and blacksmiths were in the habit of performing the less important operations of dentistry.

With the birth of these three elements of professional progress, dentistry took on new life and became divorced from the position which it had held. The first dental society formed was the New York Society of Dental Surgeons, but owing to lack of interest and combined effort in the organization its existence was brief. The plans of organization were imperfect and it is probable the organizers worked with no especially definite object in view.

Later the American Dental Convention was organized, and this, though in existence for twenty years, was finally abandoned because many of the members objected to admitting dentists who belonged to the lower ranks of the profession and not liking the idea of associating with men of indifferent ideas.

Association stimulates ambitions, develops the intellect and makes one brighter and more companionable. It gives man greater power for growth. The growing man learns something from everything he hears or sees, nothing can touch him that does not teach him, and he perfects this learning and gets the good out of it by putting it into practical application. If the knowledge is worthy he continues to be benefited by it as long as he is capable of applying it; if it proves to be unworthy he can discard it.

Men prominent in public and political affairs, brilliant speakers, know that skillful tacticians become proficient by rubbing up against other men in their own walks of life. So with the physician and the dentist. The best and most representative members of the profession are found to be active in their society affairs.

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*Read before the Louisiana State Dental Society, 1914.

The dental society contributes largely to the fraternal intercourse and good fellowship of its members by the interchange of ideas through the presentation of papers and their subsequent discussion, and by the demonstrations of the clinics; professional knowledge is increased and the standing of the profession thereby elevated. The superior knowledge of one becomes the property of all. It may be truthfully said that isolation dulls the ambition and the intellect, makes one selfish, narrow-minded and cynical.

In the early days of modern dentistry before the establishment of dental societies, the members of the profession were much nearer on a line of equality than they are today—but that standard was very much lower than it is now. Then each member of the profession learned what he could and what he learned he kept to himself, for any superority to which he may have attained added to his commercial value, and it was to his individual interest to keep his distinctive style of operating and any secret methods or processes for the performance of work to himself.

Through the influence and stimulus of the dental society all this has been changed, a more liberal tone imparted to the profession, and a desire has been created to give to the other members as liberally as they have themselves been given of the fruits of knowledge and experience.

To the younger members of the profession the dental society is a very great stimulant, giving them, as it does, an equal opportunity with the older and more experienced practitioners, of observing the performance of operations in the clinics and of themselves performing operations in which they may be proficient.

Again, a young man practicing in some smaller town attends the meetings of his state society and by seeing operations performed by skillful members becomes ambitious to make of himself a skillful operator. In a few years he is known as such, and has presented several papers at his society meeting and has contributed liberally to the pages of the dental journal and before long he leaves the little saw-mill town and enters practice in a large city. If it had not been for the dental society the young man might have been content to plod along year in and year out merely an average country dentist. It has been estimated that out of 45,000 dentists in the United States, less than 20,000 are members of the dental societies.

There should be a great many more members than there are, but because 25,000 are not members does not indicate that they are not progressive men, nor that they are not worthy representatives of their profession. Most of them are indeed men of most excellent character and thoroughly conscientious in their operations. They have never realized the benefits to be derived from attending dental meetings. Many of them have a firm impression that such gatherings are in the interest of dental dealers, others that they are chiefly for the purpose of gratifying the ambition or booming the reputation of ambitious men. Many of the younger members think it costs too much or that it takes too much time from their practice, but these are very poor reasons.

During the past few months I made it my business to get the opinions of practitioners who were not members of the Louisiana State Dental Society, and find out why they did not take an interest in dental society work. I received a great variety of replies. Some said they were in favor of dental societies if they were run right; many said that the dental societies were run to suit those members who came from the city and that the city element controlled the society. Some said that they attended, but had received no benefit, and others stated that they did not get back what they had put in. Some asserted that they had plenty to do at home without attending society meetings, and still others thought that they might be all right for poor operators and inexperienced persons to find out how to do operations in which they lacked skill. Some had entertained the idea that it was necessary to pass an examination to become a member, and had for this reason refrained from entering, while others remained out because they had never been asked to join.

The question of advertising has been the cause of keeping many from becoming members of the society, but the latter have decided that advertising is not dignified and that it tends to degrade the profession.

The member of a dental society has opportunity for extending his acquaintance. This is a source of much satisfaction and results in making many permanent friendships. To brush up against successful men, men who are making names for themselves in the profession, is very helpful and cannot help instilling ambition within those who are looking on and noting the efforts of others to get to the front. It is only in the dental societies that one can come in direct contact with the shining lights of the dental profession. It is here that the man with an idea can place it before the profession and receive due credit for whatever good he may do. Here, in a word, he has opportunity of comparing himself with other members of the profession and judging of his own capabilities thereby.

The program should be announced at least a month in advance of the meeting. There are few men who can present interesting thought in the discussion of a paper without some preparation and a few weeks' notice would prove very helpful in this respect.

A good dental society is something of a post-graduate school and next to actual experience there is nothing so valuable to the young practitioner, for there the collision of mind with mind and of thought with thought in friendly discussion awakens and stimulates the mental digestive power, and liberalizes and enlarges the scope of both the speaker and the listener, and acts as a tonic to the entire profession. Nowhere else can you study so well the individuality and the styles of different dentists and discover why each one is what he is so fully as at dental society meetings. There the specialist, the teacher, the general practitioner and the book worm, all meet and each in his own way contributes to the instruction and intellectual recreation of the others. There you can meet your neighbors on common ground, grasp each other by the hand, look into one another's faces and compare investigations, experience and opinions by face-to-face discussion.

ACCURATE, RAPID AND EASY LABORATORY METHODS

BY I. J. DRESCH, TOLEDO, OHIO

INASMUCH AS THE IMPRESSION, once taken, is the foundation upon which the denture must be constructed, it is a step upon which too much stress cannot be laid. With this thought in mind, it should be our purpose to take such an impression that its duplicate in vulcanite will not only be properly adapted to the alveolar ridge and palate, but also will stay in position during all the various muscle movements necessary in mastication.

There have been many methods of impression taking placed before the dental profession, the foremost of which, at this time, probably is the Greene method, a description of which in itself would comprise a very interesting volume. I shall, therefore, devote my time to simple, practical methods, proven efficient in actual work.

THE IMPRESSION OF AN UPPER JAW

The first step is to secure an approximate impression (one of wax will do), from which an approximate model is secured. The approximate model is then used as a guide for selecting a tray, to be used for taking the impression from which the working model is secured. A tray is selected that will nicely fit the approximate model, making sure the arch of the tray is not too high. The tray should be trimmed at the points of contact with the muscles, as indicated on the approximate model. A perfect-fitting tray is important; it should fit the approximate model fairly snug (just room enough for the impression material), but it should not compress the muscles.

With a properly trimmed tray the battle is half won, and we proceed to take the impression, conscious of that fact. Warmed beeswax is placed in the perfectly trimmed tray, cone-shaped in the center. An impression is then taken of the approximate model. After chilling in water the wax impression thus secured, surplus wax is cut away, and the edges trimmed nicely. After trimming the wax impression, scoop out or cut away enough wax to allow for a thin plaster coating (an eighth of an inch being sufficient), with which the final impression is taken. Thus the impression is a combination of wax and plaster. The combination of wax and plaster is a very happy one, enabling the dentist to secure the best results, with a minimum of plaster.

When the scooped out wax impression is coated with plaster, it is quickly placed in the mouth, the perfectly-trimmed tray and scooped-out wax impression taking it *squarely home.* While the plaster is soft the patient is instructed to make the various lip and cheek movements which bring into play those muscles which must have their definite range of action outlined in the impression. Now quickly before the plaster gets hard, instruct the patient to swallow. In order to swallow it is sometimes necessary that the patient have something upon which to make pressure with the lower jaw. In such instances place the *cloth-covered* index finger of the right hand beneath the front of the impression tray and instruct the patient to bring the lower jaw into contact with the finger. When the patient swallows the soft palate is drawn downward, having the effect of making a visible impression of its movement in the soft plaster.

The downward movement of the soft palate has taught the reason why a poor-fitting denture will often cause gagging. It is quite obvious then that the denture should not encroach upon the movable soft palate. But it is important that the entire hard palate be covered; therefore, the junction of the hard and soft palates must be definitely placed and proven, and for that purpose the approximate model is used once again. By comparison with it the outline of the movable soft palate is easily seen on the plaster impression. The junction of the hard and soft palates is then marked with a pencil, and with a penknife or other instrument, a groove is made in the plaster impression, one-sixteenth of an inch posterior to drawn pencil line; the posterior groove being reproduced on the model and finally on the finished vulcanite, a proven line is had, to which the vulcanite must be trimmed.

To sum up: Take an approximate impression in wax, from which secure an approximate plaster of Paris model. The approximate model is then used for selecting and fitting a tray, to be used for taking the final or working impression. For the final impression both wax and plaster are used. By cheek and lip movements, and swallowing action, a definite surface is determined, upon which to construct the denture.

TAKING THE IMPRESSION OF AN EDENTULOUS LOWER JAW

The method used for taking an upper impression is followed in detail. The only exception being that the swallowing action is unnecessary, and is replaced by having the patient raise the tongue and move it forward until the tip is extended from the mouth. This movement should be made while the plaster is soft, so as to definitely locate those muscles which could easily dislodge the denture.

IMPRESSIONS FOR PARTIAL DENTURES

A material for taking partial impressions should possess two distinct qualities. It should be firm enough to retain correctly the definite lines necessary to a perfect-fitting denture. It should break easily and cleanly, without flaking, so that broken parts can be readjusted readily. As those two essential qualities never have been incorporated in any material offered the profession, it is necessary that the dentist make a material that will meet the requirements. A mixture of one part pumice stone and four parts impression plaster combine every necessary quality for a partial impression material. The mixture is highly efficient, making a firm and definite impression which, in cases of leaning teeth and bell-shaped crowns, may be broken easily.

An approximate model is secured the same as for a full impression, and a perfectly-fitting tray is made. A wax impression is taken of the approximate model, and when scooped out so as to make room for the plaster coating, grooves are made in the wax, which later act as guides in replacing those pieces of plaster broken from the impression during its removal.

When an impression, either partial or full, has been taken, it is a good plan to scrape those spots which come in contact with the hard spots of the palate. This will insure against the denture riding on the hard spots after it has settled on or more or less displaced the softer area. To insure against the denture irritating the rugæ, slightly enlarge them in the plaster impression. Air bubbles and other defects of the impression are remedied with wax before pouring the model.

TAKING THE BITE

Although the mush-bite is used by many dentists, the method is no longer taught at the colleges, and is practically obsolete. The mush-bite is the cause of ninety per cent. of misfit dentures, or rather *plates;* "plate" and "mush-bite" harmonize beautifully. The victims of the mush-bite are many; we see them in the restaurant, trying to eat and balance their plates at the same time. The grotesque facial movements accompanying their efforts frighten the timid, and cause the over-humorous to laugh. Having nothing but ridicule and condemnation for the mush-bite, the allotted space shall be devoted to base-plate bites.

The first step in taking a base-plate bite is the making of a base plate that will meet all requirements. It should be carefully adapted to the model, so as to insure equal distribution of any pressure made upon it. These requirements are amply met when either a metal or vulcanite base is used, in which instance the same base is used for the trial plate, and later as the base of the denture. However, a good stiff base plate of wax will answer the purpose when properly made. After adapting the wax to the upper model, place a piece of wire across the posterior palate, fashioned so as to conform to the wax base plate, from tuberosity to tuberosity. The lower base plate is stiffened in like manner by placing the wire from tuberosity to tuberosity, on the lingual aspect of the base plate. These wire stiffeners will insure against the wax warping and also greatly strengthen the base plates.

TAKING THE BITE FOR A FULL UPPER AND LOWER DENTURE

The base plates of the upper and lower models having been made and stiffened with wire, a sheet of wax is placed over the Bunsen burner and when quite soft, one-half the sheet is made into a roll, which is then placed over the alveolar ridge of the upper base plate and sealed with sticky wax.

The wax base plate is then placed in the mouth, and the length of the lip marked upon the roll of wax which is attached to the base plate. The base plate is then taken from the mouth and chilled in water, and the roll of wax is trimmed or extended so as to bring it in line with the length of the lip, thus determining the length of the upper base plate. When the length of the upper base has been corrected, it is replaced in the mouth, and the necessary trimming or addition needed for proper facial expression is noted. A roll of wax is then fashioned to the alveolar ridge of the lower base plate in the same manner as the upper was prepared. Both base plates are then placed in the mouth and the patient is instructed to bring the jaws together until the lips are in repose and lightly touching. While in this position the upper lip is raised as in smiling, and its location marked on the wax of the upper base plate. In like manner the center of the face, length of the lip and the orifice of the mouth are marked. Small staples are then warmed, and with them the base plates are securely fastened together while in the mouth and carefully removed without displacing them.

PLASTER AND INVESTMENT MATERIALS

The needs of the dentist as regards plaster and investment compounds have been amply met by the manufacturer. Of plaster there are two standard preparations, each of which has proven highly efficient for its special purpose. Bear in mind, *for its special purpose.* Impression plaster was never meant for model making; model plaster was never meant for impression taking. New York model plaster answers the purpose admirably, but Spence plaster is better for model making. The two make a happy combination in practical work; Spence for the model, New York for the bites, articulating, flasking, etc. French's is an ideal impression plaster and can be used for all impression work. Adding one part powdered pumice stone to four parts French's plaster makes a perfect material for partial impressions.

After years of studious effort Dr. R. C. Brophy has perfected and caused to be placed on the market efficient investment materials for which the profession is indebted. Continued and largely-increasing orders for the materials sold under Dr. R. C. Brophy's name, combined with their proven superior qualities, offer ample justification for their recommendation. Many imitations of Dr. R. C. Brophy's investment materials have been placed on the market by unscrupulous dealers and for your protection against fraud, buy only those sold under Dr. R. C. Brophy's name. Dr. Brophy's Standard Investment Compound, though designed primarily for use with the Elgin Casting Device, can be successfully used with all other casting machines. Dr. Brophy's Imperial Investment Compound is a quick-setting, non-checking, fire-proof material, which is unequalied for crown and bridge work, cheoplastic operations, continuous gum work and all such purposes.

PREPARING THE IMPRESSION AND POURING THE MODEL

As it is quite impossible to procure a perfect model from an impression which has not been properly prepared, it is wise, therefore, to *have a care* with the impression. Having made sure air bubbles and other defects of the impression have been properly avoided, it is coated with a good separating medium. A good separating medium is not only essential as a time saver, but is absolutely necessary if perfect results are to be had. A separating fluid should be thin enough so as to be able to penetrate the impression; it should have color enough to make the line of separation easily discernible, thus acting as a positive guide when impression is removed from the model. It should form a glossy surface, without making a varnish-like coating; it should be an aqueous solution, that the fine lines of the impression can be reproduced on the model. Although there are many separating materials on the market, with the exception of one, all have been too friendly with varnish, which obliterates the fine lines, does not penetrate the impression, retards the flow of the plaster and being alcoholic, the consequent evaporation makes the varnish too thick for accurate work. Realizing the failings of the separating materials to be had in open market, Dr. R. E. Munn, of Cleveland, Ohio, formulated Separlac, which medium meets every requirement of a perfect separating material.

After coating the impression with Separlac, which is allowed to become thoroughly dry, the impression is immersed in water until all air has been expelled from the plaster, thus insuring against having air bubbles in the plaster cast. Contrary to general opinion, air bubbles in the cast are caused by air working upward from the plaster of the impression, which, being porous, must as a natural consequence, expel a certain amount of air when covered with a coating of soft plaster. Thus, by soaking the plaster impression in water and eliminating the air, which is displaced by the water, it is an easy matter to make casts without air bubbles.

After all air has been expelled from the impression, the plaster for the cast is mixed with a regard for efficiency. A sufficiency of water is placed in a bowl, and the plaster sifted therein so as to obtain equal and thorough saturation. The bottom and sides of the bowl may then be tapped until all air has been expelled, the surplus water poured off and enough plaster added to counterbalance the watery surface of the plaster. The plaster should then be stirred quickly and thoroughly, but not after the mix has begun to harden and the crystals have formed.

When the plaster has become sufficiently hard the tray is removed, and if it has been coated with wax, this will be done easily by warming the tray over the Bunsen burner. With a sharp knife the impression is trimmed at a point directly over the alveolar ridge until the deep pink color of the Separlac, which has penetrated a full eighth of an inch, is outlined on the impression. It is then an easy matter to remove the impression without any danger of jabbing or cutting the model. In most cases the impression can be used again for reference, or in case of emergency.

ARRANGING THE TEETH

Before arranging the teeth on the model it is best to prepare the plaster cast in such a manner as to prevent the adhesion of the wax base. As a preparation for that purpose, Castgloss is especially indicated in that it not only prevents the adhesion of the wax to the cast, but also fills the pores of the plaster, producing a hard, glossy surface, insuring a clean, hard cast throughout the entire construction of the denture.

When setting up the teeth for a full upper and lower (except when the Gysi Adaptable or Snow Face Bow is used), the upper six anteriors are placed first. The centrals are placed exactly where wanted, and sealed to place; the laterals and cuspids following in order are treated in the same manner. A roll of soft wax is then placed directly over the ridge, extending from the cuspid to the tuberosity. The bicuspids and molars are then placed in position by means of the roll of wax, which is kept soft by passing over the Bunsen burner as it becomes necessary. The opposite side is then treated in the same manner, the wax chilled and the lower teeth set to occlude with the uppers, using the same technic as before.

If a denture is to be made without a gum facing, or the teeth are to be butted, the teeth should be ground to accurately fit the model before the cast has been carved, otherwise the butted teeth would not evenly distribute the pressure made upon their points of contact.

(*To be continued*)

Nobody Won The Prize

The walking craze a few years ago gave a well-known sporting man an opportunity which he could not resist taking advantage of. He had handbills widely distributed on which was stated:

"A Great Crosby gentleman will give $50 to the man, woman or child who first succeeds in doing the following task: To walk from the Pierhead (Liverpool) to Crosby village. There each competitor must buy a meat pie and walk around the 'Big Stone' and eat it."

About a hundred entries were received and the walk took place on Whit Monday. Much excitement prevailed, and a great cheer arose as a local pedestrian was seen leading the rest of the crowd. His meat pie was soon eaten as he walked around the stone, and he went to the judge for the $50.

"Why," exclaimed the judge, "I didn't think you could have done it. The stone seemed too hard to eat."

"What's that got to do with it?" asked the ped.

"Everything to do with it," answered the judge, "and nobody gets the $50 till they do."—*London Tit-Bits.*

PULP TREATMENT AND FILLING OF ROOT CANALS*

BY THOS. P. HINMAN, ATLANTA, GA.

I HAVE SLIGHTLY CHANGED THE ORDER of things in that I will take up this morning the indications for the use of arsenic, indications for anesthesia of the pulp, and the treatment of those cases, and the filling of the canals.

Treatment and extirpation of the pulp is a thing on which we can never agree. Individual technic and the individual man are important factors in the handling of these cases. You might get results with methods with which you are familiar that would not be satisfactory to me. The things I will bring before you I think are logical and founded on sound principles. I believe the treatment of the pulp should be carried out with the idea in view of the greatest advantage to the patient. We all know of the great necessity for preserving the pulp in the sixth year molar when the roots have not completed their formation. We realize the wisdom of this, and the futility of handling these cases where the foramina are large. I would do all I could to keep these pulps alive. This will depend on the development of the patient. At the age of eight the sixth year molar is usually fully formed, while with others it is scarcely through the gum. In the last few years there has been a wave, or, I might say, a cyclone, of pressure anesthesia, and we are now reaping the results of this cyclone. In studying the effects that have arisen during my years of practice, I have seen various waves sweep over us—waves that have left in their wake the destruction of many teeth. Cataphoresis, the ionic action of medicines, and the carrying of medicines by the use of the ionic principle —that has been solved, but we suffered in its solution. We are too prone to run after things which in their finality are perfect, but when they first reach us are not complete.

I believe in taking up new things, but not too fast. Pressure anesthesia is a good thing if practiced with judgment. If you understand the bacteriology of the mouth, and know that the bacteria penetrate far beyond the point of decay; these bacteria being of a pathogenic variety, you get into danger when you force an anesthetic into the pulp, carrying infection into the periapical area. I am careful in handling cases of pressure anesthesia, because many times the outer layer of the pulp is in an inflamed condition and there may be infection present. Whenever pressure anesthesia is used, some things are necessary before the application of the medicine. First, the area over the exposure must be carefully cleaned off physically. This is necessary; if we do not remove it, it contains not only bacteria, but their by-products. Their by-products cause trouble. If the pulp shows a layer of inflammatory tissues which is filled with germs and the by-products of bacteria, and we then proceed without particular caution to force by digital pressure the anesthetic into the pulp, down to the apex, can you stop it there? No, you cannot. It goes into the surrounding tissues. You will ask me if I have seen destructive processes go on after pressure anesthesia. I have. I have had a case under my observation for over a year, that I have never been able to control, and that came from pressure anesthesia. Another case was referred to me, in which a dentist produced pressure anesthesia in a first lower molar, and evidently forced the septic matter into surrounding tissues, and thus destroyed the socket of the first molar, created necrosis, and the second molar was lost, and only by the most careful measures were we able to save the third molar. Many times, with pressure anesthesia, the teeth remain sore indefinitely. The reason is that we have forced some of the bacteria into the surrounding tissues. Therefore, it is only in the exceptional cases that I care to use pressure anesthesia.

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*The third post-graduate lecture given before the Kentucky State Dental Society, 1914

Suppose we have a typical case of pulp abscess, a thing overlooked by the majority of the profession. You say, can the pulp within itself have an abscess? without any connection with the peri-apical membrane? It frequently has. We open into the cavity and cleanse it and as we do a little exudate appears from the pulp. This is pus from an abscess that has gone on in the pulp, the balance of the pulp remaining in a semi-healthy condition. We open up, cleanse and produce drainage, and it gets well, but the remainder of the pulp remains vital. In this case pressure anesthesia is absolutely contra-indicated. Where should we use pressure anesthesia?

In cases of recent exposure and in cases of exposure by decay also, but previous to pressure I would use some method of producing a reasonable condition of sterility. None of the medicines we have are capable of producing sterility. Therefore, in handling these cases, after excavation, I apply a 40% solution of sulphuric acid to that area over the exposure. It is very powerful. After that has acted for from five to ten minutes—it is sometimes painful, but not extremely so—we are able to produce a satisfactory sterilization of this softened tissue. After this we can proceed with our pressure anesthesia.

The question of immediate root filling after pressure anesthesia is a thing I have never been able to answer satisfactorily to myself, although I have tried. It is not correct surgery. I do not believe it is proper, and I do believe there are other procedures much superior to it. Now in cases of removal of pulp, where we have an inflammatory condition in the pulp, such as, for instance, pulp abscess, I believe arsenic is indicated. Wait! I have forgotten one thing. After the pulp removal, when we have produced sterility, and we are ready for pulp removal, what material shall we use for its removal? I do not believe in cocain or adrenalin, for two reasons: first, you have no method of producing sterility of cocain solutions, nor have you a method of producing sterility with an adrenalin solution, because if you heat them you destroy their properties. Other medicines are as perfect in action, less in their toxicity, and superior because they can be sterilized—for instance, novocain and synthetic suprarenin. If you will get the novocain pluglets and use them, you can sterilize the solution; you can boil it without deleterious effect. We get an effect equal to that of cocain, and are able to sterilize it before it goes into a cavity. We take cocain and put it on the slab with an old piece of cotton and pincers, and take water which we do not know the source of, and put in the cocain, use it, and then we wonder why there is soreness.

I do not believe pressure anesthesia should be applied unless a rubber dam is in position. With it in position, we can produce a reasonable degree of sterility. Make the teeth reasonably clean mechanically. Then put on rubber dam, and after the rubber dam is on wash it thoroughly with 75% alcohol. The clamp I have on is always sterilized. Then every instrument that I use I attempt at least to have it sterile. If we do not, we run a dangerous risk. In the novocain solution, we are able to sterilize it, and we get a better effect from the synthetic suprarenin. The suprarenin is simply this: They take adrenalin and separate it into elements, analyze it, and by synthesis they compound similar elements and make this suprarenin. It has the same properties as adrenalin, and instead of losing its power by applying heat, it is not affected. If the rubber dam is thoroughly cleaned and washed in alcohol, that makes a good situation. Some one said they didn't think alcohol was a germicide, but that it only made the bugs drunk. Well, at any rate, it inhibits their growth.

Now as to arsenic. Some one has said that any man who uses arsenic in an anterior tooth was guilty of malpractice. I believe our mistakes in the application of arsenic are that we have applied it carelessly. Do not apply it at the point of exposure; make a fresh cavity in the dentin, as far as possible from the exposure, and put in the arsenic, and seal it with cement. In the other portion of the cavity, in which we have this aching pulp, I would place an analgesic solution. I will give you a good analgesic solution: ℞ oil of cloves, 1 dram; chloroform, 1 dram; cocain, 2 grains. I have had such wonderful results in cases I could not control that have been aching. I keep it on the cabinet all the time. It is remarkable the rapid action you get from this medicine. The aching, congested pulps frequently became quiet under this treatment. Why do I as above? Because I want slow absorption. Haven't you put arsenic in fresh dentine away from the ache, and it doesn't ache? If you get a slower absorption of arsenic, you do not get the irritating effect you would if you placed it in close proximity to the pulp. In the mesial or distal cavities I go on the occlusal surface, as far away from the pulp as I can, and make a small hole, and put the arsenic in there. The analgesic solution is put in the cavity made by the decay, and is just covered lightly with a piece of cotton, and over the cotton paint Sandarac varnish. Do not put the cotton in the varnish, but paint the outside with Sandarac varnish. I would not drill in close proximity to the pulp when I put in arsenic. If you will take a tooth and make a band to fit that tooth perfectly, and cement that band on, and then drill a hole through the band, and not touch the enamel at all, and put the arsenic on, it will go through the enamel and act on the pulp.

The length of time to leave the arsenic in is dependent on the individual case. With slow absorption it sometimes takes forty-eight hours. You do not get the rapid effect you do when you make the application close, and the patient lies awake all night. You can of course leave it in too long. Then you get arsenical congestion, the red corpuscles burst, the hemaglobin is released, and you get that red effect that afterward turns the tooth dark, that regular arsenical effect. I always have my patients come back the next day. I want to observe conditions, because there are some cases where in a few hours it will produce congestion, and then I know I have to go into the pulp to relieve the congestion. I do not wait for soreness. If you find congestion, the first thing to do is to remove the arsenic, the second is, you must open into the pulp, go in there with a short, sharp drill, the outer layer will not be sore, and then put in the analgesic solution I just gave you, and the soreness will subside.

We should not go after the pulp too quickly. After I know I have rather satisfactory devitalization, I always prefer to seal in some medicine, such as oil of cloves, which we know will produce a partial mummifying effect. I always prefer to wait a sufficient time until complete death of the pulp has taken place, and when I remove the pulp there is no bleeding. If you have bleeding, that complicates matters. When I find the pulp begin to bleed, I know I have removed it too quickly. Keeping away from complications makes me happy. There is but one test to tell when the pulp is dead. The first thing is to take a large sterile bur—you have your cavity clean, and the rubber dam is on. Dip the bur into alcohol and burn it off, and go into the pulp chamber, and then, with smooth broaches, go into the pulp to find sensation, and if I find all sensation gone I take out the pulp.

Do you find cases where the arsenic seems not to have acted? Yes, but you find those cases where you have applied the arsenic to the exposure and not in a foreign place. I do not recall having a case of trouble where I put the arsenic in fresh dentin. The resistance to the application of arsenic is caused by a degenerative process around the area of exposure, and the deposit of calcific matter there. If pulp stones are there we get poor absorption. If you go into fresh dentin, you get absorption.

A MEMBER: About a year ago I had a case with a cavity on the distal surface of a molar, and I made a small hole in the occlusal, and applied arsenic, and it remained a few days, and the tooth was as sensitive as when it was put in.

DR. HINMAN: In handling that case you possibly did not get your arsenic deep enough into the dentin.

A MEMBER: If it penetrates the enamel, what difference would it make?

Dr. Hinman: Yes, but if you examine microscopically the dentin, where changes come from disease, instead of dentin fibres running in all directions, there will be formed in the dentin a harder mass, showing little dental tubuli, and then I would have taken a larger bur and made a larger area of exposure, and tried to get away from the area that would not absorb the arsenic.

A member: How do you control the hemorrhage when you are taking out the pulp too soon after the application of the arsenic?

Dr. Hinman: Medicine is of no avail. The only way to control it is by pressure, by absolutely and completely filling the tooth, or the root of the tooth with some substance that will dam the blood until the process of repair can take place.

A member: How about carbolic acid?

Dr. Hinman: It is valueless. It congeals the blood, and you have to take the congealed blood out afterward. My treatment is to take the Johnson & Johnson absorbent point, take one of those little, round specimen vessels that microscopists use, with the glass top, and I put those in there, and they are sterile when you get them, and put them in there and cover them with boracic acid, and they are always ready for use. Take your point, dip it in alcohol, and force that absorbent point up, and pack it well, and it will stop the hemorrhage, and I leave that about a week. I want Nature's reparative process to take place, and we cannot get that in an hour.

Speaking on the filling of root canals after hemorrhage, I believe eight days is the shortest time a root canal should be filled after pressure anesthesia. And that tooth should not only be filled, but it should be hermetically sealed during the interim. And if you place in the pulp chamber, after packing the root with absorbent point, cotton, saturated in the white oil of cloves, which is an absolutely pure substance, that does not discolor the tooth; place that in the pulp chamber, and put in a tight gutta percha filling or, preferably a cement filling, and leave that until Nature has healed all the ruptured vessels, and then put on a rubber dam, and cleanse and fill the root canals, and do not put anything in the root canal but the filling, then you will have success. Why take a root canal that you know is reasonably sterile, has had alcohol and oil of cloves in there, and you know it is clean, why pump carbolic acid in there? I close it up, and prevent the ingress of bacteria. If there are no bacteria there, we do not need medicine to clean it. After bleeding takes place, nothing equals salt water to wash out that blood. Wash it out with normal salt solution and see what a nice, clean, white canal you have. If you wash it out with salt water, it produces solution of the blood. If you wash out the blood and take away the substance on which the bacteria feed, you have a perfectly clean area. I use salt solution a great deal.

The ideal solution, I think, is 6-10 per cent. Sometimes I have a very difficult case, and I have gotten the upper layer of the pulp devitalized, and then I frequently put the arsenic in absolute contact with the pulp. Suppose we have a case of pulp abscess, and we open into it and drain it, and clean it out, and there is that sensitive tissue, the remainder of the pulp that is left in the apical third of the tooth. That little point up there as fine as fine could be, is troublesome. Did it ever worry you? That is a simple case. Never put arsenic down there. If you ever put arsenic way down in the root canal, look out. If you will flood that with pure phenol, and then with a broach work that phenol clear down to the apex, and then take broaches and remove that small amount of tissue, you will find it can be done quite satisfactorily. After removing it, I do not think there is anything equal to a salt solution to wash out the canals. This small portion of pulp tissue is filled with bacteria and their by-products, and if you produce pressure anesthesia you may force the bacteria into the surrounding tissues, and produce bad results.

In Atlanta I said the use of drills is contra-indicated in opening root canals. There was one man who said he could go to the apex of a root with a drill, and fill the root canal. I said, "We won't discuss it; we will have a contest and see what work can be done in handling these cases." A committee was appointed, upper molars and lower molars were selected, and these were invested in these little porcelain jars up to the gum line, and two of these were numbered carefully and sent to each operator who entered the contest. He was not to remove the tooth from the investment, and he was to give a detail of his technic in handling the case. You will see the results of this work.

(Dr. Hinman shows a number of slides, going to prove the impossibility of getting to the apex of a root with a drill.)

The substance used in root filling must not be of an irritating character. I would rather force my material slightly beyond the apex, than to miss it at all. So the material I use is forced clear in. I always attempt to force the material down, to use pressure and plenty of it. It is as necessary in filling root canals that the filling material should be in contact with every internal surface of the root canal as in filling a tooth. What if a man filled a tooth and left a margin open? That would be bad, and the same is true with root canals. I use plenty of pressure, and drive the filling into every conceivable crevice. If not, I leave air spaces or open places around the root filling. Now what is the objection to this if these openings are left? The moisture and infection goes in and strikes the root canal filling, which is not tight, and gets to apex, gets into the open tissue, passes to the apex, and produces alveolar abscess.

In opening up root canals, there is one great trouble. Drills of any description, as you see, are absolutely contra-indicated. Therefore, what substance shall we use? The first thing necesssary is access. We must gain access and plenty of it. In handling the molar teeth, and in getting the cavity so we can get into molar teeth, always remember one great principle—cut toward the buccal surface. When you get into the canals, we frequently find the canals filled with little pieces of torn-up pulp, and a few pieces of hardened pulp tissue, and we pass the broach down, and it stops. There is one material, introduced years ago, that has been greatly neglected. Use it once and try it—potassium sodium compound, the Shrier's paste. It looks like a tube of a thermometer. Do not use too much of this, because when it comes in contact with moisture it burns. So use a little on a broach, and with a small broach go down into those canals, carrying this material down, and after a while it opens up nicely, and then put a little more on and go on down, and wash it out, and you can work to the apex of some very tortuous canals that way. When you find much calcific matter, and you cannot get into the canals, and Shrier's paste will not act, then use 40% sulphuric acid, put that in the canal, and with a small broach gradually work it down there, and when you find it striking calcific matter gradually work it down. When it won't go, then I seal it in and let it stay twenty-four hours. You say, seal sulphuric acid? Yes, because it is self-limiting. It will go so far and stop. Sometimes I put in ten applications of 40% sulphuric acid to get into a canal. By the gradual dissolution of calcific matter, I eventually get into the canal. When you clean out the root canal, it is hard to dry it. Acetone has a great affinity for water, and I flood the cavities with acetone and then absorb the acetone with Johnson & Johnson absorbent points, and I keep on absorbing it. I let the points stay there long enough so that the capillary attraction will suck it out. Suppose you have a test tube, and you have one drop of water in it, you could blow and you couldn't get it out, but if you take a piece of cotton on a pair of pliers, and carry it down there, it is absorbed. That is the way I try to dry root canals, by the absorbing methods. Some people are using root driers, and I believe that is all right, if the heat is not carried too high.

After the canals are dry, then the next thing is the simple application in the root canals of the following medicine. Dr. Callahan has shown us that he can not only fill root canals, but can seal the tubuli, and that is sealed with rosin in chloroform. Put a piece of rosin as big as a pea in about an ounce of chloroform. It makes it very thin. Then put this solution into the pulp chamber, and work it down into the canal. Then use that red gutta percha dissolved in chloroform, and to every ounce of material I add one ounce of iodoform. I expect that to come in contact with soft tissue. First I carry down the rosin, then I carry down my material of chloro-percha. Then put in the gutta percha points, packing them well down, and in the pulp chamber itself I take a piece of gutta percha, and create considerable force, until the patient flinches. All the roots of the teeth I fill get sore after they are filled, and I expect it, because it tells me I have gotten down into the root canals. If there is no septic material, pressure will not hurt. Then other canal points are put in and driven, and worked down and plugged in the canal, so as to absolutely hermetically seal the canal. What material should go in the pulp chamber? Impenetrable material. Did you ever open up a chamber filled with gutta percha and have it smell like a geranium? Did you ever take off a crown cemented on by oxy-phosphates, and find that it smelled good? Oxid of chloride of zinc is impenetrable, and it is the material for filling the pulp chamber.

(In contradistinction to the slides showing X-ray pictures of contest where drills were used, pictures are shown where the technic suggested by Dr. Hinman has been used, and where perfect fillings have resulted.)

Dentistry is sometimes a disease, and the principal symptom of the disease is conceit. We had a contest down our way, and every one had to cast an inlay. They took an impression, and then the tooth was taken away from them, and they had to cast from the impression. Many of them were just like a pig in a sack—it fit where it touched. Sometimes you do not go clear to the bottom of a root canal, and it is all right, because there is no trouble at the bottom. But later up above, the amalgam filling came out and moisture got in and went down alongside of the root filling, and we had an alveolar abscess. This entire matter is one that requires a great deal of care, and our work should be done with the very highest degree of care of which we are possessed.

CAVITY PREPARATION AS A TREATMENT OF DENTAL CARIES*†

BY EDGAR D. COOLIDGE, D.D.S., CHICAGO, ILLINOIS

CAVITY PREPARATION should not be treated simply as a mechanical procedure for the excavation and shaping of cavities to receive fillings, but rather as a method of treating a condition which has come about through some pathological process. The etiology, the manifestation and the progress of dental caries should be studied with the subject of cavity preparation, and without a clear conception of these underlying conditions, one is unprepared to meet the demands of this work.

The conditions that favor the development of dental caries always will be of vital interest to the operative dentist. Volumes of literature have been written on this subject, investigators have come and gone, and at the present time many are making a careful and exhaustive study of it from various aspects, endeavoring to solve the problem as to the cause of the disease and as to the peculiarities of its attacks. The work of Miller in producing artificial caries, of isolating and studying the growth and activity of the bacteria which are ever present in the mouth, together with his careful investigation of the fluid of the mouth, has given us much light on the subject of the etiology and progress of caries. The study of the structure of the teeth, their composition, characteristics and surface findings, both macroscopic and microscopic, by Williams and Black, have given us much light on the subject of susceptibility to this disease. The study of the beginnings of the dental caries, caries of the enamel, its clinical features and characteristics in regard to localization, superficial spreading and recurrence of caries, by Black, has been the opening wedge by which a scientific method of treating this condition in the region of its manifestation has evolved. To attempt to repair the ravages of dental caries without due consideration of its causes, the conditions favoring development, progress, and other characteristics especially pertaining to a recurrence is to disregard the onward march of our professional progress.

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*Read before the Northern Ohio Dental Society, 1914.

†NOTE. The paper was illustrated by a series of lantern slides beginning with the bacterial plaque upon the surface of the enamel, showing the decalcifying process beginning in the enamel, both microscopically and later becoming macroscopical and continuing until the immune area of the surface of the tooth is reached. Several slides were shown to study the susceptible area on the proximal surfaces of the teeth and the natural conditions which tend to protect teeth from caries. Extension for prevention was illustrated, showing the difference between these principles and simply cutting large cavities. Illustrations were shown of many cavities prepared for both fillings and inlays.

CLASSIFICATION OF CAVITIES

Dr. G. V. Black has classified cavities that appear upon the different surfaces of the teeth into five classes as follows:

Class I. Cavities beginning in pits and fissures in any part of the teeth in which they occur.

Class II. Cavities beginning in the proximal surfaces of bicuspids and molars.

Class III. Cavities beginning in the proximal surface of incisors and cuspids which do not require the removal and restoration of the incisal angle.

Class IV. Cavities beginning in proximal surfaces of incisors which require the removal and restoration of the incisal angle.

Class V. Cavities beginning in the gingival third, not pit or fissure cavities of the labial, buccal or lingual surfaces of the teeth.

ORDER OF PROCEDURE IN CAVITY PREPARATION

The order of procedure in cavity preparation as outlined by Dr. Black is very helpful in carrying out the definite principles of this work and if it is followed in all cases, will simplify the technic and hasten the result; they are as follows:

First, obtain the required outline form.
Second, obtain the required resistance form.
Third, obtain the required retentive form.
Fourth, obtain the convenience form.
Fifth, remove any carious dentin.
Sixth, finish the enamel wall.
Seventh, make the toilet of the cavity.

The outline form of the cavity should include the extension of its walls to such parts of the tooth's surface or surfaces that it will include pits, fissures and defective grooves on occlusal surfaces and the connecting of such points of decay as should be included in the cavity. On proximal surfaces where caries spreads in a bucco-lingual direction and where the condition in regard to cleanliness is favorable to the process of decay, the outline form requires more study to properly adapt it to the surrounding conditions. It involves not only extending the walls beyond the decayed portion of that surface but beyond the region of susceptibility to decay which may require cutting away not only that enamel necessary to remove the decayed dentine, not only the enamel unsupported by sound dentine but both sound enamel and sound dentine. Dr. Black repeatedly has called our attention to the fact that there is a definite course in the progress of caries on proximal surfaces depending on certain conditions, that there is a uniformity in the point of attack of caries and that the cavity should be prepared upon definite principles limited by conditions not of that tooth's surface in itself but by the relation of that tooth to the teeth about it.

The resistance and retention form of the cavity depends upon the flat base cut at right angles to the line of force and its box-like shape. The forces which oppose and tend to displace the filling must be considered in each individual case; however, the variation in the direction of the main forces is very slight. The force of mastication varies from possibly 50 to 250 pounds' pressure. This force is applied at right angles to the long axis of the tooth. The direction of the force in occlusion is upward and forward upon the upper teeth. This of course is resisted by the downward and backward opposing force. This is a condition which should be considered with regard to the location of the cavity, whether upon the mesial or distal surface of an upper or lower tooth; that is, the mesio-occlusal filling of the upper and the disto-occlusal filling of the lower bicuspids and molars receive a greater displacing force than the fillings on the opposite surfaces. The step cut at right angles with the axial wall carried across the occlusal surface and widened at the termination to give it a dovetail also aids in the retentive form of the cavity. The lateral force of mastication may be met in a similar way by a flat seat and parallel walls making right angles between the axial wall and buccal or labial and lingual walls. Another force is the wedging force which tends to split teeth. This force is one of the most disastrous to teeth which have become weakened by great loss of dentine. Resistance to such a force can always be obtained by shortening the cusps and covering them with the filling material so that all stress is directed upon the filling and not upon any part of the enamel. The retentive form should be of such a nature as to retain the filling against any negative force also. It has been demonstrated that a gold filling inserted between two parallel walls would support a weight of more than 30 pounds without displacement. Parallel walls will usually afford sufficient retention without the aid of undercuts, pits or grooves. However, a slight undercut in certain places might be desirable.

The convenience form of the cavity is a consideration of two things: *first*, with reference to access to the cavity, and *second*, with reference to assistance in starting the filling. It is quite reasonable that a better filling can be inserted where the cavity is easy of access and free from projecting angles and walls to build around, than where these difficulties obstruct the operation. Where separation cannot be obtained to give access to all parts of the cavity the walls should be cut away until such form is established. This will usually be accomplished in the process of obtaining the proper outline form. For assistance in starting a filling, slight grooves or acute angles may be made at the axio-gingivo-buccal and axio-gingivo-lingual angles.

The removal of decay will usually be accomplished by the time this step in the procedure is reached, but if not, should be done at this time.

The finish of the enamel wall should receive greater attention than often is given it. A study of the histological structure of the enamel impresses one with the importance of this part of the work. The direction of the rods and the direction of cleavage of the enamel in the locality of the marginal wall must be considered or failure of the operation will surely follow. The rods should all extend to the dentine or otherwise be cut away and the outer ends should be planed away with chisels to an angle of 6-10 centigrades. The object in making the cavo-surface angle is to cut away the loose ends of the enamel rods which might fall away and to prevent checking and battering while packing the filling.

The toilet of the cavity is the final preparation as washing out all cuttings, chips and dust and wiping the cavity carefully with cotton.

PREPARATION OF CAVITIES BY CLASSES

I shall not consider each class of cavities in detail but will attempt to direct your attention to some of the important *features* of cavity preparation and *their* details, mentioning some of the things which are easily overlooked but which have much to do with the success or failure of the operation. Some of these points will again be emphasized by illustration.

In cavities beginning in structural defects as pits and fissures, the significant fact is that the decay develops in the shape of a cone which has its apex at the surface and, broadening, forms its base at the dento-enamel junction.

This fact is of importance to the operator when preparing an occlusal cavity, and it must be considered carefully. The reason the decay does not spread over a greater area on the enamel surface is because of friction which prevents lodgment of food and spreading of the bacterial plaque. The decayed area broadens as it extends toward the dentine, a fact which is readily comprehended when the histological structure of the enamel at this location is taken into consideration. The enamel rods are found to converge so that their surface ends run together as they extend from the dento-enamel junction as they approach the surface. Decalcification of the enamel follows the direction of the rods and therefore the area decalcified broadens toward the dentine. The direction of the rods on the occlusal surface passes through an arc of approximately 90 degrees from the convergence at the groove to a perpendicular as half the distance between the groove and the summit of the cusp is reached, and then to a divergence from the perpendicular as the point of the cusp is reached. This should be considered while shaping the enamel wall as it would require a different amount of cutting and different degrees of bevel of the cavo-surface angle to protect all the enamel rods, depending where the wall was laid.

CAVITIES IN PROXIMAL SURFACES OF BICUSPIDS AND MOLARS

There are three points I wish to draw your attention to in regard to this class of cavities. *First*, the location of the beginning point of decay of these surfaces; *second*, the progress of decay on these surfaces; *third*, the limitation of decay on these surfaces together with the treatment by cavity preparation of each case.

First. In reviewing the works of Dr. Black or by clinical observation, one may soon become familiar with the location of the point of decay on these surfaces. Regardless of the form of the tooth or its structure, the point of attack of caries will be found to be a little gingival of the contact. This part of the tooth is protected from all mechanical cleansing either by food excursions or by brushing, and consequently colonization of bacteria occurs at this point protected by the gelatinoid plaque. Soon the enamel is penetrated and decalcification occurs in the form of a cone with the base at the surface of the enamel and the apex reaching down toward the dentine, just the opposite of the formation on the occlusal surface.

Second. As the process of decay continues it will be seen that the surface lesion assumes a narrow shape from occlusal to gingival but broadens to the buccal and lingual until the area of the tooth surface is reached, which is cleansed by mechanical friction. This limits the area on which microorganisms may become attached and be protected by the plaque and consequently limits the progress of decay on the enamel surface. However, the area which is susceptible to decay is one that demands a considerable amount of attention in each case. Dr. Black has stated that it is dependent upon the "near approach" of the teeth in the interproximal space and that each tooth has a susceptible area which may be called the interproximal *area*. The size of this area is dependent upon the shape of the contact, the sloping of the proximal surfaces to the lingual, the general rounding of the buccal and lingual line angles affecting the width of the embrasures, and the narrowing of the tooth toward the gingival, broadening the interproximal space. Not only the enamel has become involved now, but decay has penetrated the dentine, broadening out along the dento-enamel junction and the apex pointing toward the pulp. However, no more dentine has become involved in the decayed area than has enamel over it, so that no part of the sound enamel is undermined beyond the region of the surface decay.

Third. It is found now that decay on the surface has reached the limit of its progress, having extended toward the buccal and lingual surfaces from the contact until the self-cleansing area has been reached. The width of the extension of superficial decay depends upon the shape of the contact and the relation of the two teeth in the embrasures. Its extension to the gingival wall is limited by the free gum margin in the interproximal space. However, there is a continuance of decay in the dentine extending along the dento-enamel junction. Now that more dentine is involved than the enamel over it, decay having extended beneath the sound enamel, decalcification of the enamel from within outward has begun. This undermining process and backward decay of enamel may continue until checked or until a complete decalcification has been produced. It is unlimited in its progress.

TECHNICAL PROCEDURE

I trust these three points in the progress of decay will remain clear and distinct to you as the technic of cavity preparation is discussed.

Extension for prevention is a familiar term and yet one that is not as clearly understood as it should be. Its application does not involve the destruction of quantities of sound tooth structure, as is sometimes claimed by those who oppose it nor is it responsible for many mistakes that are laid at its doors.

First. The cavity of the first classification to be prepared requires an outline form which includes all the susceptible area. Not only the tooth substance which is already decalcified should be cut away but that part of the sound enamel and dentine must be included up to the lines which limit the development of plaques and the progress of decay on this surface. This is extension for prevention.

Second. This is the tooth in which the decay has extended to the limit of the susceptible area, that is, to the self-cleansing area in the embrasure. The dentine has become involved but no further than the enamel, so that no sound enamel is undermined. The immune area on this surface has been *reached* by caries so the *proper shaping* of this cavity *without* further extension is all that is required. This is not extension for prevention.

Third. This cavity is one in which the enamel has decayed to the limit of the susceptible area and the process of decay has *continued* in the dentine until there has been an undermining of the sound enamel and decalcification is going on from within outward from the dento-enamel junction. This cavity must be extended further than the other two, and yet this is not extension for prevention.

In these three cases, each one different from the other in the extent of the decay, we have only one in which preventive treatment is indicated or can be applied. The presence of large fillings in a mouth is not necessarily an evidence that prevention was practiced and it is quite probable that prevention did not enter into the conception of such cavity preparation. It is only by careful observation of conditions surrounding each individual tooth, especially proximal surfaces, that an intelligent application of these principles can be made. The attack of caries in every instance will be found to be *dependent* upon some condition favorable to the attachment and growth of the bacterial film and in every case the extent of the susceptible area is *dependent* upon the relation of the teeth in the embrasures. The free margin of the gum septum or septal crest when in its normal condition prevents caries from extending gingivally and furnishes a boundary for this margin of the cavity, but the cavity should be well extended buccally and lingually to include the small susceptible area at each angle which so often, if not included, becomes the place where proximal fillings fail.

The greatest problem of cavity preparation of today is not one of mechanical ingenuity nor one of the knowledge of a great variety of mechanical forms for cavities. There are certain mechanical principles which apply to all cavities and those are quite generally understood by the profession. In a report of the committee on Operative Technics of the American Institute of Dental Teachers, held at Buffalo in January, 1914, it is stated that 45 of the dental schools of this country teach Black's system of cavity preparation. The other schools were not heard from, so that 100% of the schools reported upon are teaching the same principles of cavity preparation. Whether the restoration is to be one of foil gold or plastic material or is to be an inlay makes no difference only in regard to the elimination of undercuts for inlays. Since it has been demonstrated that gold can be packed between parallel walls so as to sustain a weight of over 30 pounds, it is sufficient argument against the unnecessary undercutting and grooving of walls which only tend to weakening the tooth.

SUMMARY

In summarizing the subject of cavity preparation, I would say that it seems most important that it should be considered primarily as a treatment of dental caries, and that the greatest service to be rendered is found in preventive methods rather than any other. The close observation and constant study of individual cases is necessary to apply the principles of correct cavity preparation to the case at hand. However, the *principles* based upon the active causes of caries, the histological structure of the enamel and dentine together with the *mechanical details* of preparing each class of cavities are unchangeable.

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59 E. Madison St.

CHRONIC MAXILLA EMPYEMA—ITS REMOTE EFFECTS AS APPLIED TO DENTISTRY*

BY DR. E. D. ROBBINS, BATON ROUGE, LA.

The type of disease encountered by me in this class of cases is of the most chronic kind, there being few symptoms by which one can recognize the source of infection, and they were of such little consequence as far as the general comfort of the patient was concerned as to utterly disregard the sinuses or nose as bearing any relation to the general state into which the system had been submerged. For this, then, one is required to inquire most carefully into the history of these cases before the true source of infection can be determined. In my own experience, especially at first, the source of trouble was discovered almost by accident. When, however, I became more alive to the association of these chronic sinus conditions, and the general pathological state, I was impressed with the frequency with which they occurred. Chronic empyema of the antrum is invariably secondary to an acute attack. When an acute suppuration is not recognized and it is of such severity as not to undergo spontaneous cure, it becomes chronic.

The pathological conditions found are the round cell infiltration into the sub-epithelial and periosteal layers undergoing organization, resulting in a greatly thickened mucous membrane; it is not uncommon to find the mucous membrane one-half inch thick. The principal complaint of these patients suffering from chronic suppuration of the antrum, is a discharge from the nose. This may be abundant or very slight, and if the infection is from a tooth is always unilateral. The amount of discharge varies greatly, being much greater at times, the patients frequently state they are very subject to colds. In many of the long-standing cases there is considerable fetór to the discharge, which is one of the most disagreeable symptoms as it is perceptible to the patient. There is seldom any pain associated with this condition, the only pain complained of being a slight tenderness of the teeth on the affected side. Firm pressure just beneath the cheek bone will illicit tenderness. These conditions can best be illustrated to you by reporting a few typical cases. For brevity the histories date from the sinus, or condition of constitutional state produced by the sinuses.

Case 1: Miss H. suffered intensely from toothache. Some three years ago during the process of filling, the root was fractured. This was repaired and the tooth capped. A facial neuralgia developed, followed by a purulent discharge from the nose. A bad cold was assigned as the cause and the tooth forgotten. After two years of suffering she applied to me for furuncle of the external auditory canal. On inquiry, I obtained a history of furunclosis affecting other parts of the body. An autogenous vaccine had been prepared and administered, with no results other than the pain and discomfort accompanying these procedures. The nasal discharge which had been continuous now began to be noticed on account of a slight indefinite sensation of a bad odor. A careful examination revealed a chronic maxillary empyema. After a thorough radical removal of the diseased muscous membrane, the antrum rapidly cleared up. She has had no further trouble since that time.

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*Read before the Louisiana State Dental Society, 1914.

Case 2: Mrs. G., some four years ago, had the misfortune to break a first molar tooth. Her dentist treated the injury and applied a pivot tooth. Soon after she began to suffer from a purulent discharge from the nose. She submitted in turn to middle turbinectomy, curettage of the ethmoid cells, thermo cautery, etc. A few months ago she applied to me for treatment, and on looking around for some cause for this unilateral sinus infection, I found this tooth. On my advice her dentist extracted the diseased roots. I did a Douglas puncture, and after thorough irrigation of the sinus the patient had rapidly improved until now she is entirely free from her former trouble. She has not yet submitted to a radical operation and until she does will have more or less trouble at times.

Case 3: Before closing I wish to relate one more case, and while it does not involve the antrum, is nevertheless interesting alike to the rhinologist and dentist. M. J., age 24, suffered intensely from furunculosis, especially of the external auditory canal. Any one who has ever had a furuncle in this locality knows how painful they are. About every ten days I would have to treat him for one of these little pests. After a thorough search for the source of infection, I advised the extraction of a canine tooth which I found slightly tender. A small abscess of the root was revealed. In three days the trouble cleared up. And now, almost two years after, the patient has been entirely free from any further trouble.

A few words in regard to treatment will suffice. It was formerly a practice among doctors and dentists to extract the first or second bicuspid tooth and drain the sinus through the opening. This I wish to advise against as it is adapted to acute cases only, and requires the sacrificing of a tooth. A few treatments properly applied to the nose will relieve these cases. In the chronic cases we have a different condition to deal with; we must expect to deal with a human incubator, whose lining membrane has become so thick, so degenerated, that it actually reeks with pathological organisms, with warmth, moisture, and free from disturbance they grow to their joy, to force their poisonous emanations into the lymphatics to be carried to some remote part of the body, and there develop some special pathology as pointed out to you before. If this may help you to trace the infection along its tortuous path to the incubator then my time is well spent. It remains then to break up the incubator as thoroughly as you know how. Mere drainage and ventilation will not suffice. Only the most radical removal of every vestige of the diseased mucous membrane will be rewarded with complete recovery.

EXCERPTS FROM THE HISTO-GENESIS, EVOLUTION AND REVELATION OF AMALGAM*

BY T. L. MEWBORN, D.D.S., MEMPHIS, TENN.

THERE IS ON EXHIBITION in the Etruscan Musee, in Rome, a piece of gold crown and bridge work, discovered at the excavation of Roman ruins of Falerii. This skull and gold crown work was found in a hollow log which they used for burial. This relic is supposed to be 2,500 years old. Gold fillings in the teeth of Egyptian mummies have also been found, possibly three or four thousand years old.

But leaving these footprints of the lost arts buried with the forgotten ages, after the lapse of many generations, we may safely conclude that our modern dental profession, scarcely one hundred years old, has kept step with the music of the spheres, and is able and eager to meet successfully every new condition, whatever the changes of environment, or in spite of the great forces of evolutionary development.

Dr. D. M. Cattell, in one of his ablest papers, tells us of the origin of the word "amalgam," and its introduction into this country under the name of "Royal Mineral Succedaneum," by the Crawcow Brothers, of Paris, in 1833.

In order that you may better understand the status of dentistry of that day, you must know there were no doctors of dental surgery before 1842, when this degree was conferred upon the first class graduated from Baltimore—then the only dental college in the world.

Usually the boy who was too lazy to stick to the plow handle was apprenticed to, or became a student under, an experienced dentist for two or three years.

Supply houses were few, so that the young doctor's equipment was limited to a small assortment of long handle burs, excavators, chisels, pluggers, scalers, files, forceps and an operating chair that would not now be tolerated in a negro barber shop. No filling materials were used then but soft gold and tin foil. All full and partial sets of teeth were made on gold and silver plates, and single crowns were mounted on hickory pins; some of the old dentists were experts in the use of gold foil. I have seen some of their fillings that were perfect at fifty years old and looked good for fifty more. Tin foil was used for large cavities in back teeth and no attempt would be made to fill any cavity that did not have four good walls. Molar and bicuspid teeth with large compound cavities, or badly broken down, were passed up with the consolation that nothing could be done for them—just let them alone until they ached, then have them out. On the advent of amalgam, just at this critical moment, it is well said that it came in the order of the Divine beneficence to supply an imperative need. Foster

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*Read before the Memphis Dental Society, 1914.

Flagg says: "It has enabled me to save hundreds and hundreds of abandoned teeth. It has been a faithful friend to me and mine. It has enabled me to do comfortably and satisfactorily—no other word so fully expresses it—hundreds, aye, thousands of operations which had been most unsatisfactorily and uncomfortably attempted before, only to result in comparatively prompt failures. It has enabled me to restore confidence in dentistry to hundreds of patients who had almost utterly lost it at the hands of the best gold workers our country could produce. It has demonstrated to me that there is something more in dentistry than has been granted to it from the narrow range of criterion for excellence which had been so pertinaciously adhered to by those whose highest idea of professional (?) attainment was represented by an intensely solid, intensely polished, intensely elegant gold filling. These are they who waged a relentless war against amalgam in its early struggles to demonstrate the beneficence of its saving power. These are they whose committee to investigate the claims of amalgam reported that there was no tooth with decay that *could be* arrested and the organ rendered serviceable by being filled, in which gold could not be used. The report was unanimously adopted."

The pretended dread of the systemic effects of mercury in the amalgam was the great bugbear. When they discovered that mercury not only gave off poisonous fumes at the boiling point, but that it evaporated at all temperatures, even that of the mouth, then the Onondaga Medical Society, of New York, took sides against amalgam and adopted resolutions to the effect that no care in the combination or use of amalgam will prevent its occasional bad effects—sometimes producing depression, indigestion, nervousness, ptyalism, paralysis and death. In the midst of the excessive luminosity which medicine has shed upon dental effort, this work of the Onondaga medical gentlemen stands unparalleled. except that perpetrated on American dentists by that most eminent doctor, William Hunter, of London, England.

Civilization must see to it that it does not itself crush or weaken or damage its own constitutional parts. In the prosecution of original research, the misrepresentation of a fact constitutes a falsehood, and even the tendency to misrepresentation prostitutes the intellect of the specialist of scientific worker so afflicted, and advertises his incompetency for such work.

At this very convenient stage of the game it was reported that a Mr. John T. Smith had a lower molar filled with amalgam; a subsequent swelling occurred, its magnitude and extent hindered respiration; finally respiration ceased and the man was dead. It was made clear to the jury by the attending doctor that the mercury in the amalgam filling caused the death. In my own practice I have had patients come to me from their homeopathic physicians with instructions to have all amalgam fillings taken out and replaced with gold, on the assurance that their triturates could not overcome the deleterious influence of the mercury in those amalgam fillings.

Even Chapin A. Harris, in his opening address to the first class of the Baltimore College of Dental Surgery, in 1840, said of amalgam "that it was one of the most abominable articles for filling teeth that could be employed," and yet, from the wonderful virtues ascribed to this pernicious compound by those who used it, thousands were induced to try its efficacy.

After this quasi-scientific teaching, the great split in the dental profession on the amalgam question was on, with its concomitant bickerings and most bitter personalities among its members, which lasted fifty years.

Leading up to and during this period, we find that hundreds of thousands were being convinced of the efficacy of the pernicious compound, and tons of amalgam were being used annually for filling teeth.

In this most unequal contest, I speak from experience when I say that amalgam possesses characteristics with which experience can do all which demands delicacy and gentleness; everything which calls for strength and durability, almost everything which seems to bid defiance to every other material. It is these peculiarities of amalgam which have given it its power. It is not because it does not paralyze; it is not because it does not ptyalize; it is not because it does not kill, but because it does its work. Slowly but surely it has proven this; slowly but surely it continues to give the lie to its maligners and traducers; slowly but surely it is forcing itself to the front as one of the most worthy of all the materials that has ever been devised for filling teeth.

Of all the obnoxious subterfuges to cripple the cause of amalgam resorted to by the American Society of Dental Surgeons, their amalgam pledge was the most abominable. This was a pledge not to use amalgam, which forced expulsion of all members who refused to sign it, under which a number were expelled.

Long afterwards, no mention is made of the little closing paragraph of the rescinding resolution, that disgraceful avowal, that stench in the nostrils of all honest men, which gave to dental history the statement that the amalgam pledge was rescinded *because* the resolutions had accomplished the object for which they were designed, and there no longer existed any necessity for their enforcement. The whipped cur whined and the amalgam war was ended.

In 1882, during the reconstruction period, before the scars of battle had sufficiently healed, and the two factions of the profession sufficiently reunited, Doctor Talbot opened up the old wounds by publishing old garbled statements in regard to the early doings about amalgam.

Dr. J. Foster Flagg, an old enthusiast in the defense of amalgam, threw himself in the breach, published three of the most scathingly sarcastic letters in the *Cosmos*, in which he said its components, as components, have nothing to do with this question. This is not a matter of silver, nor of tin, nor of copper, nor of mercury. We have to deal with it as amalgam; and what can I say of it? I can say of it that I have found no other filling material so subservient to excessive demands. It has been, and is, equally the first choice and the forlorn hope. Its monuments of endurance are as numerous as the trees of the forest.

From the hand of dentistry has been vouchsafed the bestowal of two great blessings to suffering humanity; each of these has been severely tested; each has had its share of opposition, malediction and defamation; each has borne well the shock of battle, beating down opposition, rising above malediction, hurling defiance at defamation—each has been gloriously victorious.

These two inestimable boons are *Anesthesia* and *Amalgam.*

During the past fifty years dentistry has accomplished the most astounding evolutionary development that has ever been achieved in any department of human effort. It is not in the scope of this paper to even enumerate them.

In this great Marathon race amalgam "also ran." It has been estimated that of all the filling materials now used by the 45,000 dentists in the United States, 75% of this work is done with amalgam, and yet this large percentage does not represent more than one-tenth the revenue yielded by gold alone. If these are facts, who is the sufferer, the crook who furnishes inferior material, the dentist who courts failure by his careless methods, or the innocent victim who pays his tribute to other men's rascality, then loses both filling and teeth? The public holds the dentist, and not the manufacturer responsible for all such results. It is therefore our first duty to require and accept nothing from them but the best materials, and our highest privilege to employ these after the most approved methods for the preservation of the teeth for the longest time possible.

Doctor Ward says these alloys are curious things, the union of metals producing a result which apparently does not follow the laws of chemistry or physics, the atomic theory, nor the balanced laws laid down by Dr. G. V. Black.

An excess of silver caused the filling to expand in the process of hardening, the excess of tin caused it to contract. These results are not uniform nor reliable. We have engaged in this research work such men as Flagg, Grieves, Finchel, Ward, Harper and G. V. Black, with his satellites trailing behind.

Doctor Harper says that he is willing to go on record in the statement that amalgam does not and will not spread into adaptation, but must be driven into contact and remain undisturbed during subsequent packing. Ah, there's the rub. Will it do it?

Some recommend large smooth face pluggers, some serrated pluggers; some would have you use the pen grip with 25-pound pressure, some use the mallet. Doctor Callahan, of Cincinnati, has used the rotary motion of round burnishers in the dental engine after the Harbst method of condensing gold, but acknowledges that he does not get perfect nor uniform results. Dr. Arthur Black calls attention to the facts that fillings in those cavities in the steel matrix which were shallowest in proportion to their diameter showed the greatest leakage; as the depth of the cavity became greater in proportion to the diameter, there was more opportunity for the material to have a grasp on the side walls and the leakage was less. Doctor Black forgets the spheroidal tendency of amalgam.

In Doctor Kirk's article on amalgam contributed to the "American System of Dentistry," published in 1887, he gives the formulæ of sixty-five of the leading brands of amalgam on the market, of which fifty-nine had more tin than silver, six had an excess of silver, Lawrence's had 47% each of silver and tin with one of gold and five of copper. I have seen these fillings nearly fifty years old with perfect margins. Doctor Flagg was using his submarine alloy in 1882, composed of 60% silver, 35 tin, 5 copper, which was a balanced, non-shrinking alloy, and yet Doctor Black has the credit of discovering this principle of a balanced alloy in 1895, thirteen years afterwards.

It was four or five years ago when the National Association met at Birmingham, Ala. In discussing this same old amalgam question, the late Safford G. Perry, of New York, said, "We are now swinging around the circle, and when we have discovered a way to drive out the black devil and substitute a white angel, then will amalgam come into her own."

All of our scientists, our chemists, our metallurgists, and all of our theorists have been trying for many years to find this way, but these concede that, by all known methods, no uniform and reliable results can be obtained.

In as brief manner as possible I have given the origin or beginning of amalgam, the great part it has played in the evolutionary stages of dentistry, and now I offer to reveal to you a method by which amalgam fillings may be so thoroughly adapted to the walls of the cavity, so thoroughly condensed, welded together, crystallized and hardened, during the process of filling, that there is no chance for future change in its structure, and when properly done, results are always uniform and reliable.

In opening the discussion Doctor Cattell will tell you that my solution is in contravention of all precedent or known law of science. I care nothing for these, I am no chemist nor metallurgist; my inspiration comes from experiment, my conviction from experience

I believe a fixed formula of pure metals, the best for all purposes, about 64 per cent. silver, 30 per cent. tin, 2 per cent. gold and 4 per cent. copper.

My method is the only way to eliminate the black devil and substitute a white angel; the only way to destroy all flow and spheroidal tendencies.

Someone (possibly Doctor Black) has said that one-twelfth of an amalgam filling is air spaces; if so, the man who condenses each pellet with a flat-faced serrated plugger multiplies instead of obliterates these air spaces.

There are also thousands of almost microscopical globules of mercury known as excess of mercury, left enmeshed in the metal throughout the filling. These, for years after, are gradually volatilized and dissipated by the temperature of the body and hot food taken in the mouth. These air spaces are great aggregations of vulnerable defects which can only be remedied at the initial stage of the filling by using the *hot ball burnisher* instead of the serrated plugger.

I use three sizes of slightly oval-faced pluggers, three sizes of ball burnishers, and several thin, flat burnishers and trimmers. *I use them all hot.*

The ball burnisher is used inside the cavity with rotary and pull and push motion on each pellet as it is tamped into position, spreading and burnishing it towards the walls of the cavity. Continue this burnishing each pellet, reheating the burnisher as often as necessary to soften the amalgam, going over it several times with not more than two or three pounds' pressure, spreading and hardening as you go. In finishing and hardening, remove all free mercury from the surface by burnishing tin foil over the surface with a hot burnisher. Polish at subsequent sitting.

No sloppy amalgam will be tolerated by this method. Knuckling, contouring and cusp-carving may be indulged in to the artist's taste. Two-thirds of a molar tooth can be restored if a small-butt screw is securely set in one of the roots.

I do these restorations without the matrix. If you are accustomed to it, by all means use the matrix; but remember you are condensing the filling by rubbing it down with a hot burnisher, in all sized cavities, with but two or three pounds' pressure, unlike the serrated plugger method with "pen grip and twenty-five pounds' pressure," which displaces ten times as much laterally as the amount held by the serrations under the point of impact.

Queer Toothache Cure

As a cure for toothache, Mr. E. A. Rawlence told the Dorset (Eng.), Antiquarian Field Club at Dorchester recently, a Dorset farmer two or three years ago recommended a friend to put his arm around a young oak tree, mark the place where his fingers met, and there make a slit in the bark. Then with his right hand he was to pull some hair from behind his right ear and put it in the slit in the bark.

A Queer Telegraph System

James Means, a Boston inventor, has devised a smoke-telegraph for use on aeroplanes. Wireless telegraphy requires heavy and complicated apparatus, which needless to say, is inconvenient for the aeroplane. All that this system of communication needs is a device for making puffs of smoke. A small puff corresponds to a dot in the Morse alphabet, and a larger one to a line.

SERVICE AND COMPENSATION*

BY T. W. McFADDEN, D.D.S., WILKINSBURG, PA.

THERE ARE THREE THINGS that every dentist should always do: Always render his best service; always keep busy; always charge all he can get.

In the discussion of my paper, read before the Odontological Society, on the subject of "Building a Practice by Selling Services at Two Profits," Doctor Bratt made the remark that one-half of the dentistry was not worth one-half the price paid for it. I am going to go him one better. I believe one-half the dentistry is worth less than nothing, or one-half the dentistry, instead of improving the health of the patient, is a positive injury to the patient, and all this one-half is not done by the advertising dentists.

As I see it, the principal cause for this state of affairs is not observing the above rules in the right order.

"Always charge all you can get," is not the spirit of my paper, but first, Always render your best service, then, Always keep busy, and Charge all your service will command.

When we look at the situation today as it presents itself, we cannot well help but admit that there must be something wrong. When the pro rata of dentists is growing smaller and the proportion of decayed teeth and diseased gums growing larger, there must be some reason for this state of affairs.

When the medical profession and the laity are recognizing, day by day, more and more the relation good teeth and sanitary mouths bear to health, and still the pro rata of dentists is growing smaller, there must be something wrong.

Why is it that young men and women are not entering the practice of dentistry?

If we were to ask the young man or woman who would be eligible to the dental college of today why they do not study dentistry we would, no doubt, get a variety of reasons, but I am of the opinion that the principal reasons would be: *First*, dentistry is *real work;* *Second*, the practice of dentistry does not offer as lucrative and as influential a position as the college-bred covets.

By the time the young man has spent enough of time in college to prepare him to enter a dental college, he feels a little above any calling that looks like real work. He thinks he is smart enough to make his mark by applying his superior knowledge along some other line that does not look so much like work. If you look around you, I think you will find a great many of our best practical men came into dentistry straight off the farm. Dentistry looked like easy money to them and they were not afraid of work. They had not been educated to the point where you would lose money on them if you bought them for what they thought they were worth and sold them for what they *were* worth.

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*Synopsis of paper read at the Odontological Society at Pittsburgh, Pa., 1914.

When these fellows woke up to what they were really worth, they made money, but there are a lot of them who have not awakened yet. It is these fellows who are rendering good service and have not wakened up to what their services are worth who are keeping dentistry and themselves from occupying the position they should occupy.

The men who are rendering good service, and who are busy and are not charging all they can get are the men who are standing in the way of their own advancement, and the advancement of the profession. If we are to get good men in the profession we must offer some inducement to them. The great trouble with the young man today is, he doesn't see anything but the dollar, and I think the old men are to blame for this. They drill into the young man not to cut prices. If they would drill into him not to slight his work and keep busy, he would soon be able to command a price commensurate with his service.

The young inexperienced man who cannot render service equal to the old man has no right to as good a fee. And if the old man who can render service has not nerve enough to put his price away above the young man, it will not be long until they will all be cutting prices and doing inferior work—unless the young man has the nerve, the ability and salesmanship to boost the fees above the old man and take the lead.

If you can render service that gives satisfaction and can make yourself believe that your service is worth more than the other fellow who you believe is not as good a dentist as you are, you can make the people believe it. If you are rendering service that gives satisfaction, take the lead in raising prices. Don't wait until you can get all the dentists in your community to raise prices. Take the lead and they will follow, but you cannot move them all along with you by agreement.

You can make some of the people believe anything, whether it is true or not. It is not so easy to make yourself believe anything, whether it is true or not, and when you do you are lost, because you cannot make the Lord believe it, and the people will eventually find it out.

So, if your cause is just, make yourself believe it and then you will have no trouble making the people and your Lord believe it, and you will be saved.

Experience is costly, as all of us can tell
We purchase it at retail, and then at wholesale sell.

ANALGESIA*

BY HENRY J. FELTUS, D.D.S., BATON ROUGE, LA.

ANALGESIA AND ANESTHESIA are the angels of mercy that can do more for suffering humanity in the dental chair than all other agencies combined.

Anesthetics have elevated and dignified medicine, have placed surgery on the highest pinnacle of success and admiration. Anesthetics can and will do as much for dentistry, if we have courage enough to take advantage of the many benefits obtained from their use, as is manifest in the intelligent application of analgesia.

To our profession belongs the credit for the discovery of the anesthetic properties of nitrous oxid and ether. Horace Wells is today the acknowledged discoverer of surgical anesthesia. Dr. W. T. G. Morton, another dentist, was without doubt the first to discover the anesthetic properties of sulphuric ether, and Doctor Roland, Dean of the Dental School of Bordeaux, France, gave us somnoform. Surely these men are the greatest benefactors the human race has ever known.

By right of priority of discovery, and because of the great amount of pain necessarily inflicted to do operative dentistry properly, we certainly have the right, and should take advantage of the benefits secured by the use of these agents.

The time has arrived when we have at our command the means that enable us to practice humanitarian dentistry, and in justice to ourselves and to our patients, we should not hesitate to adopt analgesia and anesthesia in our practice, thus placing our profession on a higher plane.

With the patient placed in the analgesic stage, we can do the work painlessly, accomplish more work in less time, render better services, the hypersensitive cavity can be fully prepared along scientific lines, and that mental strain incident to inflicting pain that we all have experienced is averted. The patient leaves the chair without fatigue, in a happy frame of mind, and not dreading the next appointment.

That many dentists do not make any attempt whatever to eliminate pain is a well known fact. Some contend that it takes too much time; others argue that they desire to inflict pain in order that they may be guided as to the location of the pulp, etc. However, they are usually men who have never tried anesthesia, or taken the trouble to perfect themselves in its successful application.

Once used the patient will not permit you to operate without this God-send to dental suffering humanity. The laity will in a short time understand and demand its use.

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*Read before the Louisiana State Dental meeting, 1914.

Webster's New International Dictionary defines analgesia, "Absence of sensibility to pain." Lippincott's New Medical Dictionary says, "Analgesia implies insensibility to pain; also, absence of pain; a form of partial anesthesia." Dr. William Harper DeFord uses the term "surgical analgesia," and defines it "a state or condition of the patient in which, without complete loss of consciousness, certain surgical procedures may be accomplished without inducing pain; or the pain incident to the operation as ordinarily performed is held in abeyance to such an extent as to elicit no objection on the part of the patient."

The general anesthetics all have an analgesic stage. Nitrous oxid, nitrous oxid and oxygen and somnoform are the agents used almost to the exclusion of all others in dentistry. The analgesic stage of ether is used almost entirely for tonsillectomy, at the Mayo clinic at St. Mary's Hospital, Rochester, Minn., and rarely is it necessary to carry it to the degree of surgical anesthesia.

The analgesic stage is not difficult to produce and maintain, either with N_2O and O, or somnoform, when fully understood. The first thing necessary for success is to have confidence in yourself and confidence in the anesthetic. There seems to be a popular fear in the minds of many of the dental profession regarding the dangers relative to general anesthetics. These dangers are largely imaginary; with the necessary preparation, a little common sense and observation of a few rules, any dentist can master the procedure.

The patient is never in danger in analgesia, because the amount of nitrous oxid or somnoform given is very little.

All authorities agree that positive suggestion plays a most important part in analgesia. Dr. Edward S. Barber, of Chicago, one of the most successful anesthetists in America, says that five parts of suggestion and one part of the anesthetic would be about right for painless cavity preparation. The excitement and fear exhibited by some patients must be removed before giving the anesthetic; use suggestion and talk them out of it

In nitrous oxid and oxygen analgesia, patient is seated in the chair, head slightly forward, and the chin dropped a little so that the saliva will not run down the throat, and can be taken away with the saliva ejector (the metal tube or tip should always be used). It is not advisable to permit the patient to swallow the saliva, mucus, tooth dust, etc.; this frequently produces nausea.

The nasal inhaler placed in position, both exhaling and inhaling valves open to permit patient to breathe air and become accustomed to the apparatus, thus securing his confidence. Positive suggestion at this point is necessary and goes a long ways towards establishing confidence and co-operation on the part of your patient. The smallest amount of the gases in each bag is all that is needed, and permit only a small quantity of the anesthetic to flow into the bags when operating. A small amount is all that is necessary, and better results are obtained than when more is used.

The mouth being closed, the inhaling air valve found on the nasal inhaler should next be closed, and have patient breathe naturally through his nose; the indicator is now turned to N_2O, and a small amount of nitrous oxid and oxygen flowing from the cylinders. Six or eight inhalations usually brings on a tingling sensation in the toes and fingers; this is usually analgesia. Another test that may be noted is the point where perspiration breaks out on the forehead; also have the patients try to bite their fingers, and if they miss the mouth in the attempt, or can do so without feeling any pain, you are ready to go to work; with some, however, the bur is the best test. Remember, give just as little of the anesthetic as you can operate with and not cause pain. The analgesic stage once reached, the inhaling air valve should be opened; should the patient feel any pain at any stage, the valve should be closed again for a few inhalations. Or, if patients show signs of going to sleep, have them breathe through the mouth, or shut off the anesthetic. Some patients require the smallest quantity and others considerable. The amount of oxygen also varies with the individual. In most cases I find it advisable to let the patients hold the inhaler themselves, as it gives them more confidence, especially in the case of nervous individuals. If they become tired holding the inhaler it can be held in place with the elastic strap.

A small hand cuspidor should be used for the patient to expectorate in, as the exertion incident to leaning forward in reaching the fountain cuspidor is too much for the patient while under the influence of analgesia.

Too much oxygen will cause hilarity and too much nitrous oxid will produce unconsciousness—both extremes should be avoided. The mouth prop is unnecessary in analgesia, but of course should always be used in anesthesia. When the proper amount of oxygen is once ascertained and regulated to suit the case, do not keep moving the lever—let it alone. Many people will not breathe through the nose at all unless you tell them to do so; keep suggesting to them to breathe through the nose.

The operator should be calm and collected at all times, regardless of his feelings, and complete master of the situation, remembering that any nervousness on his part will be quickly noticed by the patients and cause them to have a lack of confidence.

Operating room should always be clean and quiet. All tight clothing such as collars, neckbands, corsets, etc., should be loosened. It is also advisable to have your patient not eat before taking the anesthetic; four hours after eating, or just before a meal is the best time to give the anesthetic for analgesia. All operating instruments should be kept out of sight.

Dr. A. E. Smith, of Cleveland, advises us to use about 5 per cent. pure oxygen, 15 per cent. nitrous oxid, and 80 per cent. air to secure and maintain the analgesic stage.

Dr. E. Andrews, of Chicago, was the first to use oxygen with nitrous oxid. Dr. Chas. K. Teter, of Cleveland, in 1899, devised the first apparatus for the scientific administration of definite percentage of nitrous oxid and oxygen. Other similar machines have since been devised by other experimenters.

Laboratory experts, both in America and abroad, have shown that nitrous oxid produces no harmful effects on the blood; neither does it irritate the respiratory tract or affect unfavorably the bladder or kidneys.

Doctor Hewitt, of London, says: "There is no form of anesthesia at present known which is so devoid of danger as that which results from nitrous oxid when administered with the sufficient percentage of oxygen to prevent all-asphyxial complications." It is the choice of all anesthetics of Doctor Murphy, of Chicago, and other eminent operators in suppurative peritonitis and in other infectious diseases. Dr. A. M. Smith considers nitrous oxid and oxygen the anesthetic par excellence.

Somnoform analgesia is advocated and used with marked success by such expert anesthetists as Dr. Wm. H. DeFord, of Des Moines. The apparatus for somnoform induction is very simple, consisting of a small bag to receive the gas attached to the nasal inhaler with a regulator to gauge the proper amount of somnoform or air required.

To produce somnoform analgesia, place nasal inhaler in position, with the air valve open and all the anesthetic cut off, so patient gets nothing but air first; then gradually admit small amount of the gas. After several inhalations the patient will usually show the analgesic symptoms. Take your time and do not try to rush things. As with nitrous oxid and oxygen analgesia, suggestion plays a most important part. The amount of anesthetic necessary varies with the individual. In case patients feel any pain, increase the percent of somnoform, and should they show signs of going to sleep, reduce the amount or cut off entirely. The same rules that govern nitrous oxid and oxygen analgesia as to position, tight clothing, empty stomach, etc., should be observed in somnoform analgesia.

Doctor DeFord claims that "you can do as much with somnoform analgesia as with nitrous oxid analgesia, and the expense of material and appliance both are less. The appliance is simpler and easier to handle."

Give your patients the benefit of analgesia. Perfect yourself in one of the approved methods; you can do better work in less time and certainly command and receive higher fees.

I am indebted to Doctors Barber, A. E. Smith and DeFord for much of the practical information presented.

A Gentle Husband

Woman (to her husband busily engaged writing)—"My dear, correctly speaking, what is a dentist?" Husband (crossly)—"Derived from dent. French for teeth, a man who pulls teeth." Husband settles down to writing again.) Wife—"My dear, you said this morning that linguist was derived from the Latin lingua, a tongue." Husband (crossly)—"Yes." Wife—"Well, dear, is a linguist a man who pulls out tongues?" Husband—"No, madam, but I wish he did."—*London Answers.*

PREVENTION OF MALOCCLUSION*

BY DR. B. FRANK GRAY, COLORADO SPRINGS, COLO.

IT IS QUITE COMMONLY STATED among the best practitioners of dentistry today, that the public is demanding the services of our profession to a far greater extent than was true ten years ago. It is my belief that the activities of individual dentists and of dental organizations which seek to educate the public in oral hygiene, is the chief cause for the impetus which has been given our work.

True enough, the efforts of the conscientious dentist for many years have been aimed at prevention—in a sense: prevention of pain, and the prevention of the further depredations of dental caries. But it is that conception of prevention which looks to the protection of the dental structures from an *environment* which *invites* disease, that has claimed the thought of so many of our best men in recent years.

Malocclusion of the teeth *ought* to be *prevented!* It is as far-reaching in its pernicious influences as any of the conditions which confront the profession. Deformed dental arches; unhygienic mouths; carious teeth; mouth-breathing; distorted and inharmonious faces—these are the results of malocclusion.

The prevention of malocclusion is so *perfectly possible* that every practitioner of dentistry surely should be keenly alive to the situation.

The teeth of the deciduous denture *must* be kept healthy and intact for their normal period of usefulness. Under no circumstances may a first or second deciduous molar be allowed to decay or be lost prematurely. If, unfortunately, such a tooth *is* lost, its space must be retained mechanically until the succeeding tooth erupts. Once the first permanent molar drifts forward into the space of the second deciduous molar, a basis of serious malocclusion is established.

What I have said of the deciduous molars is quite as true of the deciduous incisors and canine teeth.

Orthodontists are continually expending their efforts to overcome the influences of neglect. Every dentist should have definite knowledge as to the average normal period of life of the deciduous teeth, and see they are retained approximately that time—or indeed until the succeeding tooth is clamoring for eruption.

Again, in a few cases, the deciduous tooth, for some reason, is prone to remain too long in its position. The reasonable procedure in such a case is to determine, by means of skiagraphs, the progress toward eruption being made by the permanent tooth. If well along toward eruption, and the age of the patient indicates its wisdom, let the deciduous teeth be removed.

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*Read before the Colorado Springs Dental Society.

Strangely enough, the deciduous denture of some children (say at the age of four to seven years) is much under-developed. As the child approaches the period at which the permanent incisors should erupt, there should be in evidence a constant widening of the dental arch, and the so-called normal *"growth spaces"* should be appearing between the deciduous incisors and cuspids. In many cases these *"growth-spaces"* are wholly lacking. This, of course, means that the permanent incisors, with their greater width, cannot possibly find accommodation in the space occupied by the small deciduous incisors. So here is an opportunity for prevention that should not be overlooked. Gentle mechanical stimulation of the development, laterally, of these arches, should be resorted to, even at a period two or three years previous to the appearance of the permanent incisors. Dr. Barnes, of Cleveland, has called such particular attention to this, that I think his name should be mentioned in this connection.

In dealing with malocclusion, the advice to wait until all the permanent teeth have taken their positions, Dr. Brady once said, is equivalent to telling the parent to allow the case to get as bad as it possibly *can* get, before making any effort to correct it. The successful treatment of malocclusion which is at all complicated, is *tedious* and *exacting*, and requires a quality of persistence and fitness on the part of the operator that is only fully realized by those who have actually engaged in the work. Any fee that will compensate the operator, even in a modest degree, for his services, may prove a burden to the parent, if indeed, the orthodontist is not accused of "highway robbery." A child of twelve or fifteen years of age, with much irregularity, requires a treatment period of the greater part of one year, with a succeeding retention period of two years' time.

Because of the requirement as to time, and the consequent fee demanded in these established or somewhat "mature cases," only one out of the many can ever be treated. Possibly one out of seventy-five or a hundred cases only, will have the services of the orthodontist—and in communities where there is no specialist the proportion of treated cases is practically nil. The result is that hundreds of thousands of children all over the land must go on through life with varying degrees of dental and facial deformity, much of which could have been prevented by the intelligent co-operation of the family dentist.

In filling teeth with gold, certain well-defined principles are adhered to in order to arrive at a certain degree of success. So, out of all the chaotic beliefs with reference to treatment of malocclusion of the teeth, certain well-defined basic principles have finally been accepted by those who have thought most upon the subject. The great fundamental in orthodontia is *normal occlusion!* To work to any other principle is to acknowledge a degree of defeat at the outset.

A brief resume of the avenues of prevention of malocclusion might, therefore, be as follows:

a—The preservation of the deciduous teeth for their normal life period.
b—The mechanical retention of the space if the deciduous tooth be prematurely lost.
c—By noting the deciduous teeth are not retained for a considerable longer time than is normal.
d—By stimulating the lateral growth of the deciduous dental arches when the normal "growth spaces" are not in evidence, say, at six years of age.
e—By paying some attention to the naso-pharynx and nose to see that the child has no occlusion of the air-passages.
f—By bearing in mind that prevention is better than cure.
g—By remembering the best time to correct existing malocclusion is *now!*

If the question be asked: What mechanical procedures may the general practitioner follow in dealing with incipient malocclusion? I may reply:

First: Where the second deciduous molar, for instance, is lost, he may fit and solder a band to the first permanent molar; another to the first deciduous molar; connect the two bands by means of soldering a strong wire between them, and cement the little appliance thoroughly to place. Inspect it at intervals of three months until the second bicuspid makes its appearance.

Second: The dentist may stimulate the lateral development of crowded deciduous arches by means of bands fitted to the cuspid teeth on either side, to which a soft lingual wire is soldered, the ends passing a bit distal to the cuspids, to engage the lingual aspect of the first deciduous molar. With a suitable wire-stretching device the wire may be gradually lengthened, thus securing a considerable degree of expansion of the anterior part of the arch. This method will not successfully move both crown and root of the cuspid, as may be done by some of the newer methods.

Third: The dentist may note the influence of an abnormally attached frenum-labium in causing serious separation of the permanent central incisors, and may, by following a fairly simple technic, put an end to the abnormal muscular attachment, with the electro-cautery—drawing the teeth together and retaining them pending the eruption of the lateral incisors.

Fourth: If the dentist considers this work, even in its simpler phases, undesirable or burdensome, in most communities of considerable size he may co-operate with a specialist. In any event, let us not unthinkingly pass by conditions, which in their incipiency work no great ill, but the neglect of which is fraught with consequences which scarcely the full purse of the patient and the skilled hand of the operator may fully correct.

MIXED TREATMENTS IN SOME FORMS OF DENTAL LESIONS*

BY DR. ADOLPH BERNARD, MORGAN CITY, LA.

ON THIS SUBJECT there is nothing either new or original; there will be nothing calculated to enlighten any of those present, the intention being simply to recall to mind for review a subject the importance of which will easily compensate for the time that it will require for its discussion at this meeting. And it is the discussion that is primarily held in view by your essayist, as that will bring out the best points of main interest to us as dental practitioners, instead of the limited essay that is here presented.

This subject suggested itself to the writer as being likely of sufficient importance to be submitted to this gathering from a few cases to be reported and which came under observation. In this connection the old card maxim, "When in doubt lead trumps," will be unearthed to illustrate and emphasize what is to be further related in this paper.

Among the thousandfold conditions that are daily met and must receive solution by the dental practitioner is the ever-threatening demon syphilis, which by its devious and mysterious ways of manifestation in so many forms and characteristics renders a positive diagnosis very uncertain at best, in most cases demanding the attention of the average practitioner of dentistry, when the modern pathological laboratory is inaccessible for conducting the Wasserman and the Noguchi reactions which in most cases establish a positive diagnosis; but without which leaves a condition of doubt and prompted the use of the phrase, "lead trumps," which in this case is mixed treatment. With this introduction your writer will report a few of the cases coming under his observation and which prompted this short article.

Case 1—Young lady of sedentary habits from high-grade parentage and ultra refinement, had been suffering from an alveolar abscess in the lower jaw under a right cuspid, for several months, after which she visited her dentist and upon his advice the tooth was extracted, but simply extracted; no notice was taken of the necrotic tissue present at the apical end and surrounding the root of the tooth. There was very little relief and the gingival tissue soon grew over and filled in the diseased socket, leaving the entire area of diseased tissue below to care for itself, which it did rapidly, to the extent of involving the alveolar plates on both sides from this cuspid to the other cuspid and part of the bicuspid. At this point the patient came under the care of your humble servant. The diagnosis was unmistakable, "necrosis of the hard tissues," and curettage was decided upon as the treatment, which was done by thorough scraping with suitable instruments by hand and with large reamers on the engine, the intervening teeth having been removed in the operation, after which the whole area was packed with a 10% iodized phenol as the initial dressing and subsequently with phenol-sulfonic acid to stimulate granulation, and then bismuth paste was recommended as a dressing and the patient sent back to her dentist for further attention. Her condition was reported as progressing very favorably and a complete recovery was confidently anticipated by the attendant in charge, but after a lapse of a few months, the patient still complaining of severe pains all over the area which had been curetted, she was again sent to your essayist and upon examination found a small area of necrotic tissue around the region of the left lateral and which led us to suspect specific trouble. A small reamer on the engine was used and mixed treatment prescribed which was followed for several months and the patient had an uneventful recovery.

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*Read before the Louisiana State Dental Society, 1914.

Case 2—Patient had had an alveolar abscess on lower right twelve-year molar which was extracted at one of the "parlors" in New Orleans. Patient was likely discharged without surgical attention; however, the necrosis, which was present, was not relieved but progressively extended forward, involving the sixth-year molar, then the two bicuspids and cuspid, and had even begun the involvement of the lateral, when patient presented for attention. The diagnosis being very plain, it was decided to remove the teeth in the infected area, and curette all the diseased tissue as thoroughly as possible, so as to help restore healthy granulation. The usual surgical dressings were used, iodinized phenol 10% and phenol-sulfonic acid in turn, as well as balsam Peru and bismuth paste. The case progressed nicely posteriorly, but not satisfactorily around the incisors; this led to a suspicion of a specific infection, and mixed treatment was prescribed with the result that in a short while there was an exfoliation of part of the inner plate of the alveolar process, which had been unobserved at the time of the operation. The case then recovered without further trouble.

These two cases are examples of many others that have been similarly handled and with splendid results.

The treatment above referred to consists of bichloride of mercury 1-15th grain, combined with iodid of potash, 10 grains per dose, and syrup sarsaparilla compound of the U.S.P., given in teaspoonful doses three times a day after meals.

Other forms of syphilitic treatment have been used and advocated by many good men, such as Dr. Erlich's famous 606 given subcutaneously and the cacodylate of soda, both of which have their champions and the contrary, but as their administration is of necessity painful, their use does not appeal to the average dental patient.

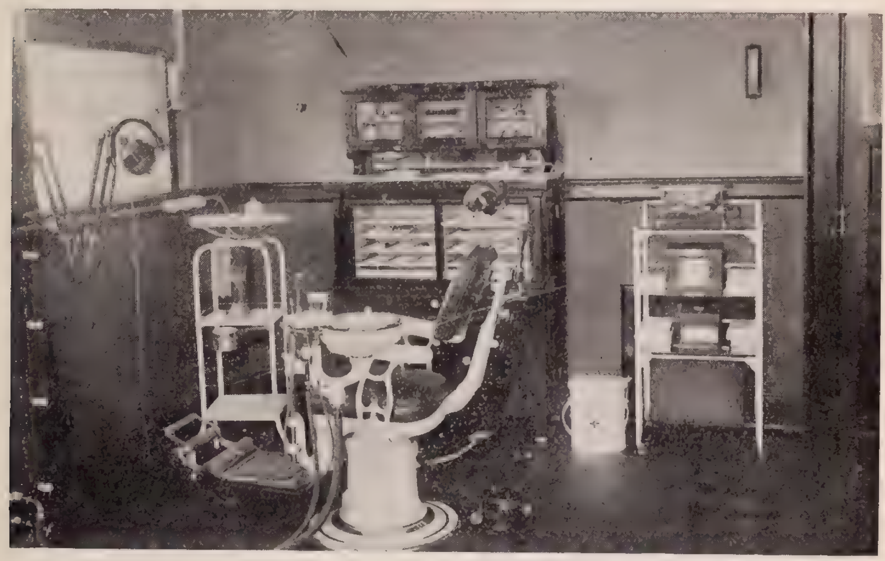
THE COLORADO SPRINGS SCHOOL DENTAL INFIRMARY

BY B. FRANK GRAY, D.D.S., COLORADO SPRINGS, COL.

The Dental Infirmary of the Colorado Springs public schools is believed to be one of the best equipped establishments of its kind in the country. The brief details of its acquisition and maintenance may be of interest and value to other communities contemplating this work.

The Colorado Springs Dental Society offered to furnish adequate dental service for those children of the public schools whose teeth were (for financial or other reasons) being neglected. It was stipulated, however, that suitable equipment for an operating room must be provided by the citizens of the city.

The school board evinced a considerable degree of interest in the undertaking, and agreed to furnish a room adapted to the needs of the work. Finally the Civic League appointed a committee to work in conjunction with certain professional men of the city, including representatives of the schools, physicians and dentists. The object of this committee was to secure the necessary funds to purchase the equipment.



The committee was headed by an able chairman, and so well was its work done that in a very few weeks' time more than eight hundred dollars were collected. The funds came not only from private subscriptions, but the Parent Teachers' Association became interested and assisted very materially. Entertainments were given at some of the school buildings, and one day's proceeds from the principal moving picture theatres were donated to the fund, the school children selling many tickets for the day's performance.

The equipment was promptly purchased. In point of quality no sacrifice was made, only the highest grade of everything being selected.

The infirmary is located in a splendidly lighted room in the new high school annex. The services of Dr. A. C. Driehaus were secured for three half days of each week. At this time, after some three months of service, the work is being carried on with much satisfaction, and with the expressed approval of the school authorities.

The patients are originally selected by the school nurse, who provides the pupil with a card bearing her own signature and that of the principal of the school. The card indicates that the pupil in question is entitled to free dental service. Likewise, the card bears the request (with signature) of the parent or guardian, that such free dental service be granted the child.

A record is made by the school authorities of the standing of each pupil at the time he is sent to the dental infirmary, and it is expected at the end of the school year that his record will again be noted, in order that some idea may be arrived at as to the practical advantages of the work.

The Colorado Springs Dental Society has made itself responsible for conducting this service for the current school year only. It is believed thereafter the society will be relieved of financial responsibility in the matter.

Attention is called to the obvious advantage, in all such undertakings, of having the dental service performed by a stated operator, employed by the dental society, in preference to the rotation of service of the various dentists comprising the organization.

New Jersey State Dental Society

The forty-fifth annual convention of the New Jersey State Dental Society will be held at Asbury Park on July 21, 22, 23 and 24, 1915.

The headquarters will be located at the Coleman House. The ballroom will be used for all meetings of the society.

The glass-enclosed Casino over the ocean, just across the ocean drive from the Coleman House, has been secured for the exhibits and clinics. With over 2,000 more square feet of floor space than the pavilion used last year, there should be adequate room.

Dr. Chauncey F. Egel, of Westfield, N. J., is chairman of the exhibit committee, and reports that applications are already being made for space.

Dr. W. W. Hodges, of Perth Amboy, is arranging for an attractive list of clinics.

The essay committee, under the chairmanship of Dr. James I. Woolverton, of Trenton, will have three essayists of prominence to present.

A cordial invitation to attend is extended to all ethical practitioners.

JOHN C. FORSYTH, *Secy.*,
430 E. State St., Trenton, N. J.

HEALTH CONSERVATION

VACCINE TREATMENT*

BY C. P. EMERSON, A.B., M.D., INDIANAPOLIS, IND.
DEAN OF THE SCHOOL OF MEDICINE, UNIVERSITY OF INDIANA

I THANK YOU SINCERELY for this very kindly reception here tonight. It is indeed a pleasure for me to come and to meet you upon this occasion. In the few minutes I have to speak to you tonight I desire to say something about the subject of vaccines generally. The discovery of the vaccine treatment, as a general principle, was, of course, a tremendous step in medical history. And yet, in dealing with it, we must exercise a very great degree of care. When a man presents a certain point of view, there are always others who do not observe his caution, and who carry that point of view much too far. The human body must be taken and studied as a whole. For every part of it is dependent upon every other part, to some degree. Knowledge of the mouth should be knowledge of the body as a whole, and should be approached from that point of view. There are some troubles that seem to start in the mouth, that manifest themselves in the mouth, but the treatment for which should be applied, perhaps, to some other part of the body. Just so there are doubtless troubles that manifest themselves in other parts of the body, the treatment for which should be applied to the mouth. In the handling of the vaccine treatment, as I stated, we must be extremely careful. If there ever was a man who knew the vaccine treatment, it was Pasteur. Pasteur never claimed that you could produce immunity with a dead organism. But, without the precaution that Pasteur used, some of his followers started in, and they out-Pasteured Pasteur. Doctor Koch was very cautious about his statements as to the tubercular treatment, but some of the men who followed him, some of them, were not so cautious. Whenever a man presents a therapeutic measure someone is apt to carry it to the extreme. The author of it will prescribe it for one thing, but the others want to prescribe it for a great many other things. A certain man resurrected some work which Pasteur had tried and had given up as worthless, the work of vaccines or pigment. If there was a man who knew the vaccine treatment, it was Pasteur. If there ever was a man who succeeded, that man was Pasteur, and that man tried it out to the limit and gave it up as hopeless. There were two things the result of his work: one the vaccine treatment for hydrophobia, which we will grant is one of the great advances in medicine; the other, for other diseases, to produce immunity. You must produce the attenuated but living organisms, and there is no stage of immunity established by dead cultures. In hydrophobia he used attenuated but living cultures. Well, that was launched, together with a test called the oxalic index test. There is not a laboratory man with university training who believes there is one bit of value in oxalic index work. I doubt if there is any man in any laboratory of a university of medicine who believes there is anything more than clinical evidence of value by vaccination with dead organisms. We grant there may be, but do not believe it. We grant that the evidence is overpowering, but we do not believe it at all. Now, what is the point? The evidence is overpowering, but there are two or three ways to explain the thing. The clinical evidence of auto-intoxication is overpowering, but I do not know a man working in a laboratory who believes in auto-intoxication. The evidence in favor of acid intoxication is overpowering, but is there any evidence left in favor of acid intoxication beyond clinical evidence? And is that enough? There is the same evidence of biliousness, but we do not think that is a liver trouble. We have arteries in the body, but we do not believe they carry arts(?) to the body, although the word would imply that. The evidence there used to be in favor of auto-intoxication, on which we were led to believe that toxin developed inside of the body, by its own process of toxin development, is gone. The evidence, if there is any such thing as auto-intoxication, is no evidence that there is bacterial infection except by a living organism. The evidence that there is such a thing as acid poisoning has been exploded. And yet there are those symptoms that we formerly called acid cases.

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*An address before the Indiana State Dental Society, 1914.

You say "a rose under another name will smell as sweet." Certainly, but they won't be treated in the same way, of course. I want to maintain as one who follows the medical profession and not the dental, that so far as the evidence goes, that which we supposed was a clinical poison is now the product of a living bacterial cell, and that so far as the laboratory evidence or clinical evidence goes—I am not interested in that just now—so far as the laboratory evidence goes, any immunity which is to be produced must be produced through the agency of the living cell. You say "a living bacterial cell?" No. That which we supposed the disease produced, like fever, for instance, the disease does not produce; it is one of the protective measures defending the organism against disease. Some of those things of which we have direct evidence that they form a part of the element, are not a part of the poisoning element, but of the protective element body, produced by the living tissue cell of the host. And yet we have the patients that are thus sick, and have the good results, clinically, of those treatments when they are sick.

A short time ago in the *Journal of Medical Science*, there was published a very good paper. It was of five cases of arthritis, illustrated by X-ray plates of the teeth. They had found foci of infection, stated that they had made proper cultures, and by an elimination test demonstrated that that person was defending himself against that germ, but the conclusion was not that; it was that they should not let those pus pockets develop in the mouth. I remember some time ago when I had charge of some work here, we had a number of cases of arthritis formans, and I remember in one month I was the cause of four persons losing every single tooth they had in their head. The fact there can be relatively large pockets of pus in the mouth without noticeable pain is a fact none of us deny, especially those of us who have seen the pus come after you drill into the teeth. The evidence of relatively large pockets without local soreness is too well established to deny it. But where did the infection come from? In the case I have in mind, the person also had endocarditis. Granting the person had arthritis and endocarditis, and infected roots of teeth, are we justified in saying that if we cleared up the mouth he would get well? We would be disappointed if we went on that assumption. Is it necessary to suppose that the teeth are infected, and then through the blood the system is infected? Why not turn it around? Supposing the germ really entered the body, as we believe it does in many cases, although not most of them, that the germ enters through the intestinal canal, and supposing the blood was charged with this germ, and the germ was carried into every tissue of the body by the blood. We can see that the heart and other parts might be affected, and the roots of the teeth might be infected also. Isn't it reasonable to suppose that pyorrhea alveolaris and latent root troubles are the result of a blood infection that came by way of the intestinal canal, as reasonable to believe that the infection of the valves of the heart, etc., came by way of the teeth? Isn't it true that cleaning out the abscess in the mouth would cure the rest of the infection? No. If a barn gets on fire and sets fire to a house, the putting out of the fire in the barn of course won't put the fire out in the house. Each tissue affected can be an agent for distribution of the germ to other tissues, and the fact that you clean out the original abscess is no indication that all the abscesses that sprung from that through the blood stream would at once go out, any more than if you put out the fire at the barn the fire at the house will be quenched.

But what does seem to be the evidence? The evidence seems to be that we have a sort of continuous circle. That which comes in through A makes B infected, and B turns around and infects A, and pretty soon we have many infections, and we cannot tell which is the beginning, and the fact that stopping one does not stop the other from starting trouble somewhere else. The argument that we are to look in the mouth for the source of infections of the rest of the body is something not yet proven. Those of us who go into it are not able to accept that. Some of us are more inclined to carry to conclusions the statements of the first writer than the first writer ever intended they should be.

Take the question of vaccine treatment. For myself, I do not believe there is a smithereen of value in vaccine treatment. I know when they began vaccine treatment, such as the work done in the bubonic plague, it was found that the treatment must be made with the attenuated organisms. I said to one of the firms making some vaccines: "What do you think of your old vaccines, anyway?" He said, "We know there is nothing in it, but there is certainly money in it." I said, "What right have you to put that trash on the market?" He said, "We are covering the ground, and we are hoping to get a fool-proof attenuated culture vaccine, because we know when we get those there will be something of therapeutic value. But," he said, "we of course know that this stuff is only culture." I asked at the Rockefeller Institute in New York a few months ago—they have been studying it with the whole staff—"What is there in the vaccine treatment?" "Not a blessed thing for therapy; there is something for protection." One of my assistants was put on a single problem, and that was whether or not there is any value in dead organisms in cases of infectious arthritis. Let us take one of those kinds of arthritis that we know well. We chose a sinus of the joints. We said we would choose only one joint; it will be better to take a number of patients with the same kind of arthritis due to the same germ, and we do not know the germ of arthritis. Well, we chose a form of arthritis, the germ of which was well known, and they chose the knee joints, as we know about as much about the knee as any joint, and could examine it more accurately than the spine. And five men spent a whole winter following out the infection in that one joint, and at the end of that year they reported one case of cure. And the next winter that colored brother was kind enough to die of tubercular pneumonia, and they made the proper examination early enough, and there in the cured joint were the living organisms. In order that a vaccine may be proven efficacious, we should be able to prove, not that the patient gets well, but that the patient produces a protective body to that organism. We do not say the treatment is not of value, but we do say it may not necessarily be of anti-toxic value. Treatments that prove good for bilious conditions do not prove that bilious conditions are due to the liver.

I would not say there is no truth to the proposition that many infections come from the mouth. I do say, however, that there is a great deal in the proposition that those infections are usually parts of larger infections, and should be treated as such. Nevertheless, we believe from the medical point of view, that it is the dentist who must not cure, but prevent, a great many of our germ infections. In medicine we have given up the idea in large measure of curing patients easily, and have gone to the attempt to find the poisons early and stop that vicious circle which, whether from the intestines or wherever else, will manifest itself. We believe in no small measure we can reach the preventive if our patients will only be willing to have their mouths properly treated, and in that connection do not be too particular to put a beautiful crown on an old dirty, infected root. I have had so many fights with dentists on that point that I am hesitating about presenting this here. Please get rid of the infected root before you hide it all over with a bridge or crown. Although it may not be true that the great source of these infections is the mouth, whether it be the mouth or the intestines, or the tonsils or the lungs, or somewhere else in that vicious circle, that is likely to develop; if we break it quickly enough we do our patients good. Do not take it too seriously, what I have said about the vaccine treatment—about the so-called anti-toxin treatment. The fact that there has not yet been any reliable experimental evidence—I do not grant that clinical evidence—although there has been no experimental evidence of the value of vaccines or of vaccination or anti-toxin treatment with dead cultures, we do not say that there may not be some treatment later on, based on that, that will be valuable, but I do say that we are carrying it just about ten thousand times too far, and it is time we quit.

I think that it is a shame that we inject these things into our patients. You know the old idea was that boils get the poison out of the blood. If there is any way of getting a vaccine which is accurate, it is that way which does not lead to a local reaction, which manifests itself primarily by some beneficial evidence, and does not wait six to eight weeks or a month before there is any evidence of the cure. We can explain in other ways this improvement which patients make under vaccine treatment. Nevertheless, we always assume that since we gave it for the infection in the mouth, and since at the end of several months the infection in the mouth disappears, that therefore our vaccine did it all.

I thank you for the cordial reception and close attention you have given me. I want to be remembered as saying two things: There is evidence that things start in the mouth; there is less evidence that you can cure it in the mouth. There is evidence that many infections of the body are to be cured; there is no experimental evidence as yet that that cure is going to be through vaccination.

Tennessee Board of Dental Examiners

The Tennessee Board of Dental Examiners will meet in Nashville, June 7, 8, 9, 10 and 11, 1915.

Examinations will be both theoretical and practical. The theoretical examination will be in writing. Applicants must furnish instruments and material for any work required by the Board, and must present to the Board a diploma that he or she has graduated in dentistry at some college recognized by the National Association of Dental faculties.

All persons desiring to take the examination must file their applications with the secretary at least five days before the meeting of the Board. A fee of $15.00 is charged and must accompany their application blanks. Application blanks can be obtained by addressing

Dr. W. G. Hutchison,
Eve Bldg., Nashville, Tenn.

THE STATUS OF THE DENTAL PROFESSION AND ITS RELATION TO PUBLIC HEALTH QUESTIONS*

BY HOMER C. BROWN, D.D.S., COLUMBUS, OHIO

I assure you that if I could get up and tell a nice little story, as Doctor Buckley did, and say that I was not going to make a speech, and then could make as eloquent an address as he did, I should feel quite well satisfied. However, I will eliminate the story and state that I appreciate the privilege of meeting with the Indiana State Dental Society once more. I seem to be like another visitor whom I understand you have about as regularly as you have your meetings, Doctor West, of Chicago. I am getting the habit, and I am not so far away from your capital city but that I hope to meet with you on other occasions. On this occasion I bring to the Indiana Dental Society greetings from the National Association. I do not think it is necessary to do more than to commend the officers and committees for presenting the very excellent program you have on this occasion. I assure you that such parts of it as it has been my privilege to hear have been an inspiration. In this connection I might state that I have been in different sections of the country in the last few months, and the enthusiasm that prevails in the dental society meetings is such as to inspire any one who has taken an active part in the reorganization of our profession. I look forward to great results from our organizations as they are today, and to the accomplishment of a very helpful service to humanity through our research commission. I was highly gratified today to know what the men of Indiana are doing for this highly important work. I am quite sure, if there is anything that is going to attract the attention of the medical profession to us, or be more responsible for their looking to us for co-operation, it is such work as the research commission is doing. It is a great thing also that our good friend, Doctor Price, is giving us so much of his time and energy in stimulating an interest in this work.

The status of our profession today is largely due to the personal sacrifice of our pioneers, who, through close application and peculiar fitness, accomplished much under adverse conditions. They took a serious view of life and their responsibilities, and improved their opportunities; they builded for humanity and for the future; they blazed paths and erected markers which will become more conspicuous as time goes on; they, through necessity, developed genius and many of the improvements and conveniences incident to present-day practice resulted from their efforts. They may have been more secretive at one time than we are today, but we are the recipients of the results of their inventions and investigations, and we should give honor to whom honor is due.

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*An address before the Indiana State Dental Society, 1914.

Dentistry as a profession received its first professional recognition about three-quarters of a century ago, and this was largely brought about through three distinct and nearly simultaneous movements. First, the establishing of the first dental college; second, the organizing of the first dental society; third, the publishing of the first dental journal. That was an epoch-making period in dentistry, and when we consider the interest referred to just a moment ago, through our organizations and through our research work, together with the fact that the medical profession and the laity, together with civic and philanthropic organizations, have their eyes focused upon us, we must recognize this period as being another one for history making.

You find my subject reversed, so that it is "Relation of Public Health Questions to Dentistry," and as I have a bad throat tonight, and you have a full program, I am only going to speak briefly of some of the work we are doing in Ohio. We are conducting a campaign of public health education. Some ten months ago we got together a very elaborate exhibit, and we take this to various county seats, where it remains for one week. We send out some member of the staff each night for a lecture. We have an oral hygiene lecture, and on the night of these lectures some one familiar with the subject is assigned for that occasion. Our lectures are stereopticon and are followed by a moving picture film relating to the subject presented, of 1,000 feet. This makes quite an interesting program. The moving picture is an attraction to many people, and some will go to see the pictures if not to hear the lecture. All together, this is stimulating quite an interest in our state.

Reference was made a while ago to prevention. I fully agree that it should be our object to prevent rather than cure. I think in our dental profession we realize that our first duty is to prevent rather than cure, and by that realization we can best fill our place in life. Corporations with large interests employ counsel to keep them out of trouble, by advising them what to do and what not to do, rather than go on and get into trouble, then employ counsel to get them out. I think the time will come when the public will appreciate the importance of looking to the physician and the dentist for such measures as may be termed strictly preventive. Then we will not have so much constructive work to do, and physicians will not be treating so many cases of preventable diseases. This will be brought about largely through co-operation and education.

The man who tries to drown his troubles in the flowing bowl usually finds that they are equipped with life preservers.

EDITORIAL

New Dental Legislation

A new amendment to the dental law of the state of Ohio and a new law in Arkansas have just been passed by the state legislatures. Some of the new features in the Ohio law are as follows:

The secretary of the State Dental Board must give a bond to the state in the sum of two thousand dollars, conditioned on the faithful discharge of the duties of his office.

The State Dental Board may affiliate with the National Association of Dental Examiners, as an active member, and pay regular annual dues to said association of dental examiners.

An applicant for examination by the State Dental Board shall also present with his application a certificate of the state superintendent of public instruction, that he is possessed of a general education equal to that required for graduation from a first-grade high school in this state. Said superintendent of public instruction shall issue a certificate without examining the applicant, provided the applicant presents to him one of the following credentials: A diploma from an approved college granting the degree A.B., B.S., or equivalent degree; a certificate showing graduation from a high school of the first grade; or from a normal or preparatory school, legally constituted, after four years of study; a teacher's permanent or life high school certificate; a certificate of admittance by examination to the freshman class of an approved college granting the degree A.B., B.S., or equivalent degree. In the absence of the foregoing credentials and before issuing such certificate, the applicant shall be examined by said superintendent of public instruction in such branches as are required from a first-grade high school and to pass such examination shall be sufficient qualification to entitle such applicant to a certificate.

The State Dental Board may revoke or suspend a license obtained by fraud or misrepresentation, or if the person named therein is convicted subsequent to the date of his license of a felony involving moral turpitude, or become guilty of chronic or persistent inebriety or addiction to drugs; or if the person holding such license shall advertise with a view of deceiving the public, or be guilty of any grossly immoral conduct likely to deceive or defraud the public, or which disqualifies the applicant to practice with safety to the people.

It shall be unlawful for any person or persons to practice or offer to practice dentistry or dental surgery, under the name of any company, association or corporation, and any person or persons practicing or offering to practice dentistry or dental surgery shall do so under his name only.

Dentists in this state shall be exempt from jury duty.

Whoever, being a manager, proprietor, operator or conductor of a place for performing dental operations, employs a person who is not a licensed dentist to perform dental operations as defined by law, or permits such person to practice dentistry in his office, or whoever practices dentistry under a false name, or assumes a title, or appends or prefixes to his name, letters which falsely represent him as having a degree from a legal dental college, or impersonates another at an examination held by the State Dental Board, or knowingly makes a false application or a false representation in connection with such examination, shall be fined not less than one hundred dollars nor more than two hundred dollars.

Arkansas, on February 17th, enacted a splendid law. In the first place the Arkansas State Dental Association recommends men for appointment on the State Board of Dental Examiners and the governor appoints them. This provision is much better than making the appointive power a purely political one for members of a State Dental Society are in position to know of the qualifications and fitness of men for this work and the safeguarding of the people.

The new law states also that no person shall be eligible to appointment on said board who is in any way connected with or interested in any dental college or *the dental supply business.* Among the things that justify the revocation of license are: The publication or the circulation of any fraudulent or misleading statement as to skill or method of any person or operator. The commission of a criminal operation, or conviction of felony, or chronic or persistent inebriety, or drunkenness, or confirmed drug habit, or in any way advertising to practice dentistry, or dental surgery, without pain, or advertising in any other manner with a view of deceiving or defrauding the public or in any way that will tend to deceive the public, etc.

The law also requires annual registration of each person registered, or licensed, by the board, to practice dentistry in the state, and the fee is $1.00.

Legal practitioners of dentistry are exempted from jury duty.

Dentists must practice under their own names only. It is unlawful to practice under the name of company, association, corporation, etc.

The reciprocity clause provides for licensing a dentist from another state who has been lawfully licensed and continually engaged in practice for five years next preceding the filing of his application, and is desirous of moving to Arkansas, provided that the state from which he comes shall have extended a like privilege to dentists practicing in Arkansas.

The law also states that "legally licensed druggists of this state may fill prescriptions of legally licensed dentists of this state for any drug necessary in the practice of dentistry."

The Miller Memorial

At the next meeting of the Ohio State Dental Society in December, 1915, the W. D. Miller memorial, illustrated on another page in this issue, will be unveiled. The memorial will cost $5,000 and is in course of construction. Most of the state and other dental societies and some other organizations have contributed to the fund.

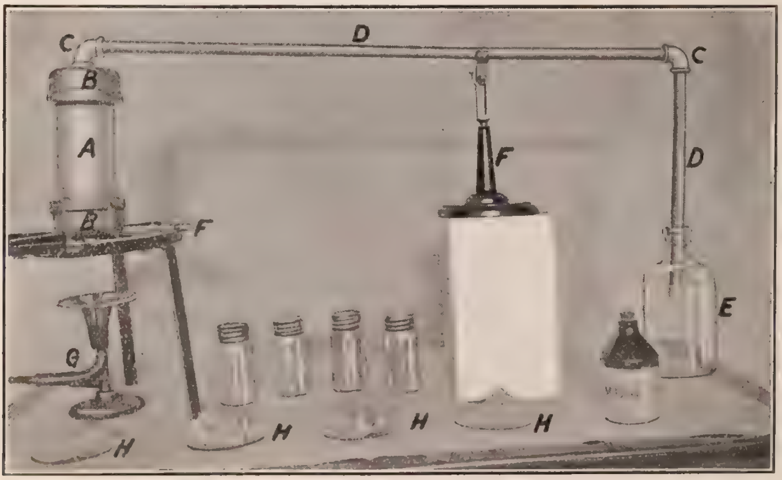
The memorial will be placed in the lawn in front of the Carnegie Public Library, in Columbus, Ohio, the capital city of Doctor Miller's native state. The entire granite work of the memorial will be in two pieces (base and die) of pink Milford granite. The bronze work consists of three pieces: the statue itself and two inscription tablets, large enough to contain desired inscriptions. The lettering on the bronze tablets will be raised. The statue will be eight feet high, conspicuously located in the grounds at the head of State street.

The memorial will be a fitting tribute to the late Doctor Miller and an honor to the dental profession.

"THE BUSINESS SAVING SIDE OF DENTISTRY"

BY A. F. LINSCOTT, D.D.S., MARION, OHIO

An article under the above caption appeared on pages 306-7-8, in the April number of THE DENTAL SUMMARY. By an unfortunate oversight an illustration was omitted. In order that the article may be complete in files and bound volumes, the illustration, with explanatory title, is printed herewith.



(A) Nipple, two inch, barrel of retort.
(BB) Caps forming top and bottom of jar of retort
(CC) Elbows for the connection of pipes
(DD) With retort
(E) Flask for the reception of mercury
(FF) Stands for the support of retort
(G) Fire under retort
(H4) Chloride of silver

OBITUARY

MR. FRANK RITTER, President-Founder of The Ritter Dental Mfg. Co., Rochester, N. Y., died Thursday, April 22, 1915, following an operation for appendicitis, aged 70 years.

Mr. Ritter was born in Astheim, Bavaria, Germany, December 19, 1844. He came to this country at an early age and, after working in New York City and Amsterdam, N. Y., came to Rochester, where he first engaged in the manufacture of parlor furniture in a factory in North Water street. In 1887 he established the Ritter Dental Manufacturing Company, which company has been one of the greatest factors in the introduction of improved appliances to the dental offices of this and all other countries where modern dentistry is practiced.

Mr. Ritter belonged to that class of quiet philanthropists who accomplish so much and about whom so little is known. One of his chief desires in life was consummated a few years ago in the establishment and endowment of a home for aged persons in his native town of Germany. Mr. Ritter went there two years ago and attended to the details and since had been in active touch with the work.

In addition to his life work in connection with the concern founded by him, he was a director of the Lincoln National Bank, and until quite recently a member of the Board of Park Commissioners, in the work of which he took great and active interest. Mr. Ritter is survived by his wife and two daughters, Mrs. Robert C. Shumway and Miss Laura Ritter.

MISCELLANY

Report of the Ohio State Board

To the Editor of The Dental Summary:

The dentists throughout Ohio are not familiar with existing conditions, especially those coming under the jurisdiction of the State Dental Board. This, to my mind, is due to lack of circulation and publicity given to the report of said Board, especially among the dentists of the state, to whom these matters are of much concern. Further, a closer acquaintance with these matters will undoubtedly cause our men to be *as diligent* on insisting that the State Board enforce the law now about to be enacted as they are solicitous in seeking appointments for friends, regardless of merit or ability to officiate properly on said Board.

I am enclosing you a copy of their last report and as The Dental Summary is the official organ of the Ohio State Dental Society, I respectfully ask to have it published in your coming issue.

Yours very truly,

Edward C. Mills.

Columbus, Ohio, December 31, 1914

To Honorable James M. Cox, Governor of Ohio:

Sir: We have the honor to submit herewith the following report of the proceedings and of the finances of the State Dental Board for the year ending December 31, 1914.

The board as constituted consists of H. C. Matlack, D.D.S., Cincinnati, president; J. R. Owens, D.D.S., Cleveland, treasurer; R. H. Vollmayer, D.D.S., Toledo; J. Nicholas Smith, D.D.S., Marietta; Holston Bartilson, D.D.S., Columbus, secretary.

During the year the board has held stated meetings as required by law, on the third Tuesdays of June and October. At these meetings were conducted the examinations of applicants for license to practice. A special examination was held in Cleveland, February 11th and 12th; at this examination two applicants were examined, both of whom failed.

At the June examination 150 applicants were examined, of which 117 were issued licenses; at this time four applications for reciprocity were received, to each of these applicants a license was issued.

At the June examination of the colleges of this state, Starling Ohio Dental College of Columbus presented 40 applicants; of this number one failed.

The Ohio College of Dental Surgery of Cincinnati presented 28 applicants; of this number 8 failed.

The Cincinnati College of Dental Surgery of Cincinnati presented 10 applicants; of this number 4 failed.

The Western Reserve Dental School of Cleveland presented 43 applicants; of this number 7 failed.

Many of the applicants at this time were re-examinations.

At the October examination 41 applicants were examined; of this number 19 failed.

Four duplicate licenses have been issued during the year, upon proof of loss of the originals.

We attribute the many failures to lack of preliminary education and faulty teaching. We have no complaint to make of state schools, as the failures from this source are almost nil. The large number of failures has increased illegal practice in this state and we beg that a law be passed to require a standard of preliminary education.

Many of the private dental colleges of this country are a menace to public health. They maintain a National Association of Dental Faculties with published rules and regulations, which in many cases exist only on paper. One rule to which they point with pride is the rule on entrance, which requires a high school diploma or an equivalent examination, the word "equivalent" in their hands being more elastic than fiction ever dreamed of being; "all is wheat that comes to the mill."

We have in our possession signed statements of applicants who have taken these equivalent examinations, and the papers many of them have submitted in examination lead us to believe these statements are true.

We beg to submit verbatim a few of these alleged examinations these signed statements contain.

Examination of Mr...:

Q—What is your name?

Q—What did you do before you came to college?

Q—How much High School have you had?

Q—How did you come to study dentistry?

Q—Have you any relatives as dentists?

Q—Are you married?

Examination of Mr...:

Q—Why do substances fall towards the earth?

Q—Why does a silver spoon become hot when placed in a cup of hot water?

Examination of Mr...:

Q—How old are you?

Q—Are you married?

Q—How many children have you?

Q—What did you do before entering college?

Q—Do you like dentistry?

There are no typographical errors in the aforesaid questions, but are verbatim as in the signed statements of the applicants.

After taking the aforesaid examinations these men were given certificates, which read as follows: "I do hereby certify that I have examined the preliminary educational requirements of Mr.................................. and find them satisfactory and in full compliance with the requirements for entrance into the freshman class of.., under the Equivalency High School Clause of the Regulations of the National Association of Dental Faculties.

(*Signed*)...

(*Official Examiner for the Ohio State School Commissioner*)

We have on file two letters from Hon. Frank W. Miller, superintendent of Public Instruction, which read as follows: "In reply to your inquiry of June 22d, I will say that Mr............................ and Mr............................ have no official connection with this office whatsoever."

(*Signed*) FRANK W. MILLER, *Supt.*

July 16, 1914, a second letter was received: "This office does not recognize any appointee to give examinations for admission to any of the dental colleges of this state. There is nothing on record to that effect."

(*Signed*) FRANK W. MILLER, *Supt.*

Under the present law we must accept students for examination, regardless of their preliminary training. We have been informed by many students the time devoted to some of the most important studies was almost zero and the papers submitted in examination lead us to believe this is true.

During the past year state sanitation laws have been violated by some of the private dental colleges in their clinic rooms.

We believe the State Dental Board to be one of the departments of public health, and its highest function to conserve the health of the people of this state, and we beg that the dental law be amended with this factor in view.

Claims that cannot be verified are made in catalogues. This is neither just nor honest to the student or to the parent.

FINANCIAL REPORT

Receipts

Balance in the hands of the treasurer, Jan. 1, 1914	$1,873.41
Fees for examinations	4,150.00
Fees for dulpicate license	20.00
Fees for endorsements to other states	25.00
	$6,068.41

Disbursements

Per diem of members	$2,000.00	
Transportation of members	281.85	
Hotel bills of members	458.40	
Carriage and car fare of members	17.90	
Expense of examinations	52.20	
Office supplies	22.55	
Engrossing of license	45.25	
Postage and registration of license	52.00	
Typewriting	30.55	
Printing	149.35	
Salary of secretary	720.00	
	$3,830.05	
Balance January 1, 1915		$2,238.36

HOLSTON BARTILSON, *Secretary*

SOCIETY·ANNOUNCEMENTS

An Invitation to a Dental Clinic

The directors and faculty of the Texas Dental College of Houston, Texas, and the Alumni Association of the Texas Dental College, have concluded arrangements for an all-day clinic to be held during the day of May 18th, and every dentist in the state of Texas, and to as many out of the state as desire to be present, a cordial invitation is extended to attend.

Dr. Chas. C. Bass, of New Orleans, who has done much work on the subject of oral endamœbae and their relation to pyorrhea alveolaris, and who is considered an authority on the subject, has accepted an invitation to be present, and will give a complete lecture, and demonstrate the use of emetine hydrochlorid; the methods, technic, etc., for successfully combating the ravages of this heretofore dread disease.

During the day there will be papers and demonstrations appertaining to dentistry by men of recognized standing in this profession.

The 18th of May will also mark the opening of the new college building of the Texas Dental College. The commencement exercises will take place on the same date, in the evening at Beach's Auditorium, beginning at 8:30 P.M., and be followed by the annual banquet of the Alumni Association.

The new college building will be located at the corner of Franklin Ave. and Fannin street, in the heart of the city, and when completed will be one of the finest and best equipped dental colleges in the southwest.

Efforts are being made to secure special rates to Houston, so that those attending the meeting of the State Dental meeting at Galveston the following day may have an opportunity to hear Doctor Bass.

Michigan State Convention

The fifty-ninth annual convention of the Michigan State Dental Society, held at Grand Rapids, April 15-17, 1915, has passed into history as one of the most important and successful ever held, not only on account of the large attendance and harmony that prevailed throughout, but as well on account of the extent and nature of the work accomplished.

The program was one of unusual merit, and was received with the attention that it so amply deserved. Full report of proceedings will appear later in these pages, THE DENTAL SUMMARY being the official magazine of the society.

Following are the officers elected: F. Ward Howlett, Jackson, president; E. C. Bowles, Detroit, vice-president; C. G. Bates, Durand, secretary; E. J. Chamberlain, Grand Rapids, treasurer; W. W. Gibson, Grand Rapids,

E. A. Honey, Kalamazoo, executive council. The following were elected to honorary membership: J. Ward House, formerly of this city, but now of San Diego, Cal.; J. A. Watling, of Washington, D. C.; George Field, of Detroit, and R. M. Pelton, of Detroit.

The 1916 meeting will be held at Detroit.

West Virginia State Board

The next meeting of the West Virginia State Board of Dental Examiners will be held in the city of Charleston, W. Va. Examinations will begin at 9:00 o'clock A.M., June 9th. For further information address the secretary,

DR. H. H. SMALLRIDGE,
Charleston, W. Va.

Arkansas Examination

The Arkansas State Board of Dental Examiners will hold an examination at the Marion Hotel, in Little Rock, Ark., on Monday, Tuesday and Wednesday, June 21, 22 and 23, 1915. Applicant must be a graduate of a reputable dental school. Examination theoretical and clinical. Application and fee should be in the hands of the secretary fully two weeks before the examination. For further particulars, write

IRVIN M. STERNBERG, *Secy.*,
Fort Smith, Ark.

Pennsylvania State Board

The next examination of the Pennsylvania Board of Dental Examiners will be held in the Musical Fund Hall, Philadelphia, and the College of Pharmacy Building, Pittsburgh, on Wednesday, Thursday, Friday and Saturday, June 9, 10, 11 and 12, 1915, the practical work being held on Wednesday, June 9th, at 1:00 o'clock. Application papers can be secured from the Department of Public Instruction, Harrisburg. For further information address the secretary,

ALEXANDER H. REYNOLDS, *Secy.*
4630 Chester Ave., Philadelphia, Pa.

Indiana State Board

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing June 14th, and continuing six days.

For application blanks and full particulars address Dr. Fred J. Prow, Secretary, Bloomington, Ind.

Rhode Island Dental Board

A regular meeting of the Rhode Island State Board of Dental Examiners will be held at the State House, Providence, R. I., June 23, 24 and 25, 1915. For further information apply to the secretary, William B. Rogers, 171 Westminster St., Providence, R. I.

South Carolina State Board of Dental Examiners

The next annual meeting of the South Carolina State Board of Dental Examiners will be held at Columbia, S. C., beginning at 9:00 A.M., Tuesday, June 15, 1915.

All applications must be in the hands of the secretary not later than June 5, 1915.

Application blanks and instructions for applicants may be obtained by addressing R. L. SPENCER, *Secy.*,
Bennettsville, S. C.

Wisconsin State Board of Dental Examiners

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at Marquette University, on June 21, 1915, at 2:00 P.M., for examination of applicants to practice in Wisconsin.

High school diploma, application and $25.00 fee to be filed with the secretary ten days prior to above date.

Dental diploma to be presented in advance of the examination.

Junior dental students presenting a clear card for two years' unconditional work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in the following six major subjects: Anatomy, Physiology, Histology, Chemistry, Bacteriology, Materia Medica. Satisfactory grades made in these subjects will be credited at subsequent examinations.

Special application blanks for this examination and $10.00 fee, together with high school credits, to be filed ten days in advance.

S. H. CHASE, *Pres.*
W. T. HARDY, *Secy.*
404 Majestic Bldg., Milwaukee, Wis.

Michigan State Board of Dental Examiners

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants who wish to practice dentistry in Michigan, will be held in the Dental College at Ann Arbor, beginning Monday, June 14, 1915, at 8:00 A. M., and continued through Saturday, June 19. For application blanks and full information apply to

A. W. HAIDLE, *Secy.*, Negaunee, Mich.

Georgia State Dental Association

The forty-sixth annual meeting of the Georgia State Dental Association will be held in Atlanta, Ga., at the Piedmont Hotel, June 17th, 18th and 19th, 1915, beginning at 11:00 A.M., Thursday, June 17th. We have every assurance that this will be an interesting meeting.

Every ethical dentist in Georgia is respectfully invited to attend, and become a member of this organization. Also, a most cordial invitation is extended to members of other associations to meet with us.

For further information address M. M. FORBES, *Secy.*,
803-4 Candler Bldg., Atlanta, Ga.

Lake Erie Dental Association

May 20, 21, 22—just the time of year that tired feeling begins to steal over you. Why not attend the Lake Erie Dental Association, at Hotel Bartlett, Cambridge Springs, Pa.? Good papers and clinics and a delightful spot to spend the week's end. J. F. SMITH, *Secy.*

The Susquehanna Dental Association of Pennsylvania

The fifty-second annual meeting of the Susquehanna Dental Association will be held at Irem Temple, Wilkes-Barre, Pa., May 18th, 19th and 20th, 1915. GEO. C. KNOX, D.D.S., *Rec. Secy.*

The Louisiana State Dental Society

The thirty-seventh annual meeting of the Louisiana State Dental Society will be held in New Orleans, June 3, 4, 5, 1915, at the Grunewald Hotel. DR. P W. TROWBRIDGE, *Secy.*

North Carolina State Board

The next regular meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at nine o'clock on Monday morning, June 21st. Full information and application blanks may be secured by addressing the secretary. DR. F. L. HUNT, *Secy.*, Asheville, N. C.

National Dental Protective Association

The annual meeting of the National Dental Protective Association will be held in Washington, D. C., May 18th, 1915, at the Dental Department of George Washington University, at 7:30 P.M., for the election of trustees and transaction of business.
E. P. DAMERON, *Pres.*
M. F. FINLEY, *Secy.*

Northern Ohio Dental Association

The annual convention of the Northern Ohio Dental Association will be held in Cleveland, June 3, 4 and 5, 1915.
WESTON A. PRICE, *Pres.*
C. D. PECK, *Secy.*

Tennessee State Dental Association

The forty-eighth annual meeting of the Tennessee State Dental Association will be held at Sewanee, Tenn., June 24, 25 and 26, 1915. A fine meeting is assured. C. O. RHEA, *Secy.*

Minnesota State Dental Association

The thirty-second annual convention of the Minnesota State Dental Association will be held in Minneapolis, June 11 and 12, 1915.
MAX E. ERNST, *Secy.*, St. Paul, Minn.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV JUNE, 1915 No. 6

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

Editorial Office: 195 16th Avenue, Columbus, Ohio
L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

THE DAY OF THE SHELL CROWN IS PAST

BY JOSEPH A. GARDNER, D.D.S., MEMPHIS, TENN.
DEAN COLLEGE OF DENTISTRY, UNIVERSITY OF TENNESSEE

MANY YEARS AGO, when artificial crowns were in their infancy, a dentist was in a measure excusable for placing in the mouth a two-piece shell crown, which is not only unclean, unscientific, and inadequate to meet the requirements of a crown, but injurious to the health and comfort of the patient. But at this time of international, national and local dental societies, where clinics and papers are constantly being contributed, dealing in detail with this important subject, and in this day and time of numerous dental journals filled with scientific facts upon the subject, how can a dentist justify himself for committing such a mistake as placing in the mouth a two-piece shell crown, without the slightest resemblance of tooth form?

I firmly believe that it is due to ignorance, which should not be accepted as a justifiable excuse, and if the following questions could be correctly answered and a proper remedy successfully applied, we would no longer have these distressing conditions: Why is it that we do not have a larger attendance at our society meetings? And why do we not have more dentists read their journals? As I say, if these two questions could be properly answered and a remedy applied, it would not longer be a daily occurrence for us to observe in the mouths of our patients gold shell crowns, worn through on the occlusal, ill-fitting bands at the gingival, and caries attacking the tooth at that point; shell crowns where there has been no attempt at the restoration of the contact point or maintenance of the interproximal space, or proper occlusal form, either one of which will result in disease of the gum, injury to the adjacent teeth, general systemic disturbances, as well as constant discomfort to the patient and final loss of the tooth.

One might say that some of these important points could be omitted in the construction and application of any other form or character of crown. That I will admit, but in the opinion of the writer, it is not so likely to occur in the construction of a cast-base dowel crown employing a detachable porcelain tooth, as in the construction of a two-piece shell crown, after one becomes familiar with the technic in the construction of the cast-base dowel crown employing one of the replaceable porcelain crowns or facings.

This article has special reference to the posterior artificial crowns. I am happy to say that few there are today who place all-gold crowns on the anterior teeth. I want to go on record as being opposed to the use of a two-piece shell crown in any position in the mouth. I also oppose the use of shell crowns of any form or character, other than in exceptionally rare cases. And when they are employed, as a single crown, or an abutment for a bridge, they should conform to the following requirements:

A perfect fit at the gingival line, restoration of the contact point, maintenance of the interproximal space, proper contour and proper occlusal form. And I know of no better method than the following, which I have employed for the past few years:

The stump is prepared in the usual way, other than with a little more cone shape, a band is made so that it will be a little larger in circumference at the occlusal than at the gingival end; it is trimmed at the gingival end to conform to the attachment of the gum, contoured so as to reproduce the contact point and provide for the interproximal space and, of course, proper buccal and lingual form.

At this point the band is removed, inlay wax fused on the inner surface of the band all the way down to the gingival end and while the band is warm and wax quite soft, it is placed on the stump in the mouth and a plug of inlay wax, which is at the proper temperature to be slightly resisting or stiff, yet pliable, placed on the occlusal end of band, and pressure is exerted on the wax until the soft wax on the inner surface of the band makes its appearance all around under the free margin of the gum. The case is then chilled with ice water and trimmed at the gingival, removed, inspected, and if the outlines are not as you like them add more wax and repeat as before until an accurate impression is shown in the wax of the entire stump as far down as desired. Now add soft wax to the occlusal end, allowing patient to bite; chill case with ice water, carve cusp, remove case, insert sprue wire, invest and cast, using 22k. gold throughout.

In the opinion of the writer, this is the most accurate method that we now have at our command. This has been made possible by the wonderful discovery of Dr. William H. Taggart, of Chicago, as well as many other possible improvements due to his ingenuity. But the use of a shell crown, even if made by this method, cannot, in my opinion, compare with a cast-base dowel crown, using a replaceable tooth. And I advocate the use of a cast-base dowel crown, employing a replaceable tooth or facing, in the posterior portion of the mouth in preference to a shell crown, for the following reasons:

First—Because, in the opinion of the writer, one can more closely approach perfection in the joint at the gum line by employing a cast-base dowel crown, constructed in the following manner: Prepare the root in the usual way for a plate dowel crown, select a Blue Island band of aluminum, 36-gauge and proper size, insert dowel in canal, reduce band to about one-sixteenth of an inch in width, replace on root. The band confines the wax and with a large amalgam plugger a perfect adaptation to root can be obtained. Before chilling, take hot canal plugger and fuse wax to end of dowel, insert sprue pin, chill and remove wax form with band in position, and then remove aluminum band, invest and cast. If band is desired, employ a band of 22k., 36-gauge gold instead of the aluminum band and cast direct to band and dowel.

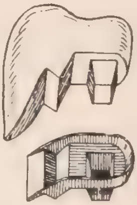
By employing 24k. gold for the cast base, it can be easily adjusted swaged and burnished to the basic end of root in the mouth, and I know of no better instrument to use for swaging the thin cast base of 24k. gold directly to the root than a home-made instrument which I have used for some time. Select a rubber instrument handle of medium size, drill a hole in the end into which insert vulcanite rubber, which makes a most excellent swager and which inflicts very little discomfort to the patient. A few blows with a hand mallet with rubber against the cast base forces it home, and by the use of the burnisher one can get an accurate adaptation. Bite and impression are taken with base in position, removed and mounted on the articulator, backing is made for the porcelain facing, case is waxed up, invested and soldered.

Second—Because one can select a replaceable porcelain tooth which meets the requirements of occlusal form and general contour, and my observation is that few all-porcelain teeth inserted in the mouth, retained by a dowel, fail to have restoration of contact point, and the maintenance of the interproximal space.

Third—Because of the esthetic effect of porcelain over gold and because of the porcelain occlusal surface being much more efficacious in mastication.

I advocate the use of the tooth which I have designed, and which is shown in the accompanying cut, because it can be ground on the occlusal surface without exposing a pin or hole or in any way weakening the tooth. Because of the fact that it can be used in very short bites and the base may be either swaged directly to the tooth by the use of 24k., 36-gauge gold in the Ajax, or any similar swager, with very little trouble or time, or it may be cast with little or no difficulty.

Many operators have found similar difficulties to those related by Doctor Bramwell in his recent article in the December DENTAL SUMMARY, page 963, that of the impossibility of grinding the occlusal surface in many of the replaceable porcelain teeth which are now on the market, without materially weakening the tooth, on account of the hole which penetrates the occlusal portion almost to the occlusal surface from the ridge or lingual aspect.



The design of all the replaceable facings, except the one shown in the accompanying cut, precludes their being employed in any case except where the bite is very long. And I agree with Doctor Bramwell that no dentist, however skillful, should attempt to use the tooth which he refers to in any case except where the bite is very long.

This is the very thing that prompted me to work out the design of a tooth which can be used not only in very long bites, *but also in short bites, and in cases where it is necessary to have a perfectly flat occlusal surface,* and my observation and experience have led me to believe that in most of the cases where porcelain is demanded by the patient, the teeth are small and the bite short.

I believe that it is a conceded fact that the highest degree of esthetic taste is manifested among the people of small, refined, delicate features and people of delicate features necessarily have small teeth and short bites.

Personally, I have never been able to use any of the forms of replaceable porcelain teeth, except the one shown in the accompanying cut, in cases where I was most anxious to use them on account of the patient being insistent upon the employment of porcelain instead of gold, because of the shortness of the bite.

I have never been able to employ a porcelain tooth, so far as I can recall, where it was not necessary to grind on the occlusal surface to a greater or less extent. And on account of the tooth which I had designed having a greater base than occlusal surface, without employing metal at the ridge end, and without a hole or pin for the retention of the facing, makes it possible to grind the occlusal surface of this tooth to a great extent without injury.

So far, I have not run across a bite so short or an occlusal surface so flat that the above designed tooth would not most satisfactorily accommodate. And, as I claim, with this design of a tooth, a carborundum stone and a little brains, there is no need to make a gold shell crown or gold dummies, other than in exceptionally rare cases.

DIAGNOSIS AND TREATMENT OF TRIFACIAL NEURALGIA*

BY HUGH. W. MACMILLAN, D.D.S., CINCINNATI, OHIO

THE NUMBER OF PAPERS which have appeared on neuralgia the last few years would seem to have exhausted the subject. Still there are many cases of so-called idiopathic neuralgias that have tortured patients many years with no apparent relief in sight. Injections of alcohol, resection of the Gasserian ganglion, unwarranted extraction of teeth, nerve stretching, and high-frequency currents have all been tried, with only partial or temporary relief. The real cause of the disease in each incurable case has not been determined, and until the real cause has been found, rational therapeutic measures cannot be applied.

An irritation to any branch of the fifth nerve may cause obscure neuralgic pains. The irritant may vary from an impacted tooth to a detached retina; from a pulp stone to an ethmoiditis; from hypersensitive dentin to a tumor in the middle fossa.

It is my intention to bring before you one peculiarly obscure form of irritation which has resulted in severe cases of trifacial neuralgia and tic douloureux.

When a tooth is abscessed we find from X-ray examinations that there is an area of rarefaction around the apex of that tooth, indicating necrosis. From the examination of skulls exhibiting chronic abscesses in connection with the teeth, we find there is an actual loss of osseous tissue. In resection of abscessed root ends we will assure ourselves that there is an extensive loss of tissue that does not only exist in skulls but is an actual occurrence in clinical cases. By bacteriological examination we will also find that this area is teeming with infection.

At this stage the tooth is usually extracted and in the great majority of cases the abscess is drained and resolution results. But this is not always true. The gum may heal over this abscess cavity, leaving this area to result in an infected sinus, which may persist indefinitely. If the area of necrosis is confined to the alveolar process it will disappear with the absorption of the process. But if the deeper parts of the process or the bone itself be involved, this small area will persist sometimes for years as a low grade, subacute irritation, hardly strong enough in itself to cause great damage or even discomfort. When old age or disease lessens the body's natural resistance this area lights up and causes irritation to the nerves, which react at first in a mild form of neuralgia, generally attributed by the patient to a cold or "just neuralgia." From the constant, repeated, or intermittent irritation the nerve supplying this area finally becomes hypersensitive and reacts in an exalted degree, giving rise to burning, stabbing, cutting pains.

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*Read before the Ohio State Dental Society, 1914.

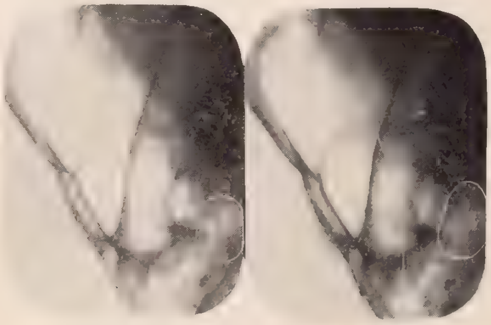

Fig. I—Radiograph Illustrating Case 1.

The foregoing statements seem to be a tale woven to meet the needs of this theory, but suppose we cite facts: By pressure over the area affected, in these cases, for example, we will find that the area is tender and gives rise to the identical neuralgic pain of which the patient complains. By X-raying the part we will find this tender area to be an area of rarefaction. By questioning, the patient will give a history of a tooth that had been sore to bite on, a swollen face, and after extraction of the tooth, a sore jaw—a history of every extracted abscessed tooth. In surgical treatment we will actually find this area of necrosis. By anesthetizing the area when the patient is in pain we can produce a cessation of the pain which will last as long as the effect of the anesthetic lasts. And in further proof, by proper treatment following the laws of psychology as well as therapeutics, we will produce a cessation of the pain that is not temporary but permanent.

Case 1. Mrs. J. B., aged 46, suffering with tic douloureoux, referred by Dr. E. W. Mitchell. Patient had suffered with severe pain in her left jaw and side of her head for two years with occasional temporary relief by slight surgical operations. The pain was sudden, sharp and jerking, with paroxysms lasting ten to fifteen minutes, appearing at frequent intervals during day and more pronounced at night. The pain would always appear when food was taken into the mouth.

All the teeth were extracted five years previous, except the left cuspid. Shortly afterwards this tooth became sore and was extracted. The pain did not stop with extraction of the tooth and the socket was treated. Finally the gum healed over. Pressure over the cuspid eminence disclosed a tender area. The lip was reflected and the bone exposed by a sharp excavator. At the point where the apex of the tooth would have been, the explorer passed into an area of necrosis about the size of a pea. This area was curetted, packed and treated, and the pain has disappeared. The area of necrosis was afterwards found on X-ray film.

Case 2. Mrs. M. E., age 55, was referred to me for an incurable neuralgia. Her pain was mostly in the upper left jaw, but would be reflected in the lower jaw, the tongue, and ear. The left side of her tongue would feel as though sharp pieces of glass were cutting into it. When the pain appeared, the muscles of the eye and face would twitch and jerk. For five weeks she refused food, except what she could obtain through a tube, on account of the agonizing pain from opening her mouth. She even used a writing tablet so she would not have to move her lips in conversation.

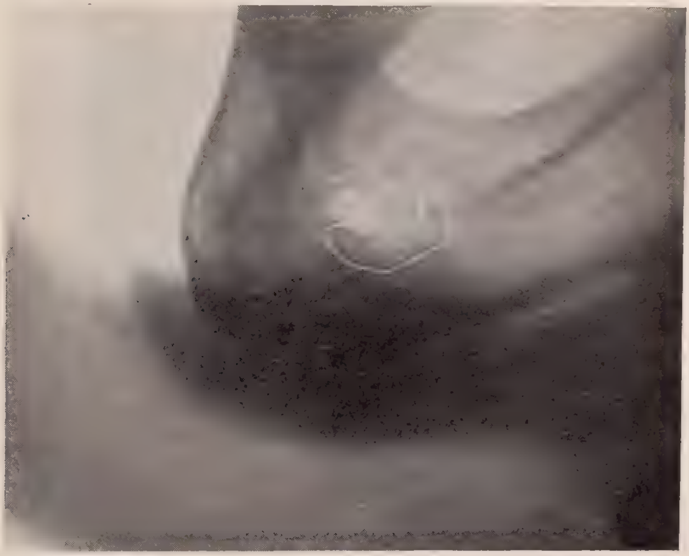

Fig. 11—Radiograph Illustrating Case 2.

In March, 1913, second upper bicuspid was filled and ached occasionally afterwards. In November, 1913, the tooth became sore and was extracted. Patient said there was an abscess on the end of the root. After the tooth was extracted pain seemed to radiate over the whole side of the head. Socket was treated without relief. Patient in bed for two weeks.

On April 29 she came under my care, the foregoing history was obtained and several radiographs taken. Pressure over the gum where the tooth had been extracted brought a painful response. Patient thought the neuralgic pains started from there. Gum was reflected and alveolus scraped. Pain seemed to be relieved but returned in a few weeks.

On August 28, upon an examination of the radiograph of the lower jaw an area of necrosis was found in the region occupied by the apex of the lower second bicuspid before it was extracted. The history was a tooth tender to bite on, with soreness of the jaw after extraction. The lower first bicuspid was extracted and through its alveolus the area of necrosis posterior to it was curetted with a surgical bur. The wound was packed and treated. The pain was relieved and has gradually disappeared.

Case 3. Mr. J. H., aged 55, was referred to me because he could not have an impression taken on account of a tender area on the left side of his upper jaw. He also complained of pain in his left ear. He said that the ear seemed at times to "close up" and for the time being he would become deaf in that ear.

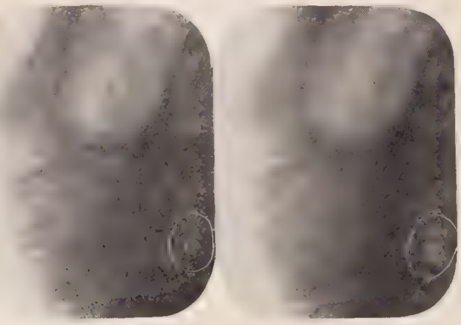

Fig. III—Radiograph Illustrating Case 3.

The tender area was in the region of the cuspid eminence. He gave a history of an abscessed cuspid tooth and said that the socket was very painful after extraction. The socket was treated and finally the gum healed over.

When he came under my care the lip was reflected from the bone and a small area of necrosis found in the region where the apex of the cuspid had been. The area was curetted and packed. The pain in the ear became better immediately and the hearing improved. The man is now wearing a full upper plate. An examination of the radiograph after the operation disclosed the area of necrosis.

Case 4. Sister M. T., aged 55, edentulous, suffering with tic douloureux, referred by Dr. R. Seigle. Pain began four years previous and steadily increased in intensity. Patient had been treated during this time with alcohol and quinine urea hydrochloride injections. Pain would be relieved for a week at a time.

The pain extended along left superior maxillary nerve and side of nose, radiating to eye, ear, forehead and upper lip. It was characterized by burning, sudden, flashing paroxysms which lasted for half an hour. Patient said that it felt like "a shovel of red hot coals were in the face," and that the pain started like "little burning threads." It occurred several times during the day, principally in the mornings.

Diagnosis: Pressure by the finger on the upper left jaw disclosed a tender area over the cuspid eminence. Continued pressure caused a relief of the pain. The history of this area was that the cuspid tooth had been abscessed for years before it was finally removed. An X-ray at the time was not available to confirm the diagnosis that this area of necrosis existed but the operation proved it.

By the use of novocain the outer plate of the maxilla was removed and the cancellous structure thoroughly curetted. Under treatment the pain finally disappeared for the first time in four years.

In Cases 1 and 3 the areas of rarefaction in the radiographs were observed after the operation. Since I had never read of any similar diagnosis I did not lay any particular stress on the dark spots in the films and really thought they were water marks. After listening repeatedly to the tales of sore and abscessed teeth from these and similar cases, the truth gradually dawned on me and the explanation of these shadows resulted.

Undoubtedly, the reason why trifacial neuralgia and tic douloureux has always seemed at times incurable is because the etiology has been so obscure and because the manifestations of pain have not been properly appreciated. We must learn to associate certain pains with certain causes, acting to produce that pain, and the cause of the pain will often be known before even an examination of the part is made.

These small areas seem almost incapable of producing such nerve reactions, but we must remember that these cases have sometimes extended over years and the constant, steady, perpetual irritation finally so exasperates the nerve that it becomes hyperesthetic and reacts in an exalted degree. The nervous system is not yet an open book, but we cannot dispute facts even though we know not the cause. It stands to reason that these areas of necrosis can produce the pain and proper treatment of them has certainly resulted in a cure.

301 Andrews Building.

DISCUSSION

Dr. W. S. Locke, Cincinnati: The term Neuralgia is one which seems to be applied to all pains which are obscure and cannot be accounted for by any recognizable lesion. Its causes seem to be varied but the principal ones are, no doubt, lack of stimulation and in many cases, pressure.

I fully agree with the essayist that the most important step in the treatment of neuralgia is in making a correct diagnosis and of recording a history of the symptoms; but there are so many different forms and causes as well as the different stages of progression of this disease that make it a very difficult thing to do.

There are many cases in the early stages where the patients' statements are of little value and when all tests common to our use fail. They come to us complaining of pain, pain so slight and intermittent that they cannot well describe it, nor are they sure of its exact location. Such patients are usually irritable and if a cause and a remedy are not given at once, pass on to another and another of the profession, until some lucky one (due possibly to the lapse of time and more advanced stages of irritation) makes the correct diagnosis and treatment.

While it is true that pain is caused by irritation and that different forms of irritation cause different manifestations of pain, yet we are at times led astray in our diagnosis by reflected or radiated pain which offers to us false irritation and false location of pain.

I do not quite agree with the essayist as to the definition or diagnosis of true tic douloureux, which is only one of the many forms of neuralgia.

As I understand it, it is an obscure irritation of a nerve without any apparent inflammation. The pains are sharp, stinging and spasmodic and sometimes cause twitching by contraction of certain muscles, especially those of the cheek, upper lip, infraorbital foramen and lower eye lids, while it affects the mucous membrane and tongue by sharp, pricking sensation, as though stuck by a pin.

If this definition is correct, then tic douloureux is an acute irritation and has no connection whatever with chronic abscesses.

CASE NO. 1

Some years ago a lady presented herself to the writer with a slight but very irritating pain in the lower jaw, and made the statement that she had gone the rounds of the professional men, both medical and dental. She said her teeth were extracted one after another with no relief. She was told by several doctors that her pain was imaginary and that there was no trouble there. Upon questioning her it was learned that the lower right first molar had been extracted some months before she first noticed this pain and that all the others as far forward as the cuspid had been removed afterwards. There was no inflammation whatever and all the tissues looked firm and healthy.

She complained of a slight stinging pain at times when moving her jaw, or when touching upon the arch lightly with the finger. The pain was intermittent and the more she tested, the more uncertain she became. When heavy pressure was made upon the arch there was no pain whatever.

From her description a thought was suggested that possibly there might be a nerve ending immediately under the mucous membrane or that spicula of bone had been left in the socket of that first molar, causing an irritation to some nerve ending.

It was suggested that, at her risk of being benefited, an incision could be made over the alveolus and the underlying tissues be burred and curetted with a possible chance of tearing away the cause of this irritation. This was done and the pain ceased at once.

As the writer was no better informed than the doctors who preceded him, the operation, although successful, disclosed no secrets, and it will be left to you to determine what that irritating cause may have been.

CASE NO. 2

A few years ago a lady from Atlanta, Ga., came to Cincinnati to be treated for nervousness. She complained of pains in her ear while her right eye twitched incessantly. She also complained of a slight pain in her lower jaw, and located it about the cuspid tooth. The doctors were fearing facial paralysis. The writer was called in consultation and found the lower right first and second molars gone. There was no inflammation and all the other teeth were in good condition. The third molar owing to the closeness of the bite was only slightly protruding. It was suggested that it be extracted. This was done and the pain ceased at once. Upon the examination of the socket it was found that by putting an instrument to the bottom it came in contact with the inferior dental nerve, which was abnormally located. This fully explained the trouble and the lady went home free from pain and her nervousness cured.

CASE NO. 3

This last July a gentleman came to me complaining of pain in the neighborhood of a bridge. This pain was only occasional and at no time severe.

In making the usual tests I could find nothing wrong with either of the crowned teeth. The gum tissue was firm and healthy without any signs of inflammation whatever. I put him off from time to time waiting for development. The development happened and one day he came in with a swollen face. An X-ray showed a piece of root immediately under the bridge.

This pain differed from the first two cases in that while it was obscure it was just an occasional dull pain, while they were acute stinging pains.

CASE NO. 4

A few weeks ago the writer was called to see a case where the symptoms were as follows:

The lady complained of her joints hurting and especially the knee joints and the wrists. She complained also of her teeth hurting, but could not locate the spot. After a very careful examination and finding nothing wrong she was sent to a specialist that the tonsils and throat might be examined. At first no serious trouble was visible, but it was decided to remove the tonsils and within one was found quite a large pus pocket. Almost immediately the lady commenced to improve and we are hoping that this was the exciting cause of her trouble.

Doctor MacMillan has given the subject of trifacial neuralgia, and I might add all obscure pains of various kinds, a great amount of study and thought. He has been careful to note and make a record of every little symptom so that with the help of such men as he, I hope we will soon be able to differentiate one pain from another, so that we can quickly arrive at a conclusion in these obscure cases and treat them intelligently and effectually.

Dr. H. C. Brown: I want to commend Doctor MacMillan for presenting this very excellent paper, and to particularly commend him for the care he takes in his details. I am quite sure he has profited by this and anyone who follows the same course in the conduct of his practice, or in the preparation of papers, will likewise be greatly benefited. I shall confine my discussion to referring to two or three aggravated cases of obscure origin which have come under my observation.

A lady, 66 years of age, had entered a hospital with a view of having whatever portion of her superior maxillary removed as might be necessary in order to correct a condition that had been present for a number of years. Her trouble began 35 or 40 years before as a neuralgic disturbance and had been treated by physicians, specialists and dentists without relief. Her antrum had been opened and treated several times and she had undergone at least two minor surgical operations distally to the antrum, but without results. Her case had been diagnosed both as tubercular and cancerous and as a last resort she had decided upon drastic measures in order to secure relief, as her trouble had been growing decidedly worse in the last few years. All of her upper teeth had supposedly been extracted and she had been wearing a full denture for several years. There was no thought given to the possibility of an unerupted tooth being responsible for her trouble, but an X-ray developed an impacted upper third molar. The position of this tooth was such that nothing but an X-ray would have determined its presence and when it was discovered I was called in to remove it. The patient was anesthetized and the surgeon in charge of the case cut down through the soft tissue and chiseled away more or less of the bone. In this way I was able to secure such a forcep hold that I had hoped to remove it without much difficulty. However, it happened that the crown of the tooth was more or less carious and the root badly exostosed. These conditions, and the age of the patient, were enough to make the tooth easily fractured and it required several efforts before it was completely removed. The patient made a most satisfactory recovery and was entirely relieved from her neuralgic condition from which she had suffered for many years.

Another case was where a small portion of a root had been left and a bridge inserted over this. The lady had suffered from a neuralgic condition for a number of years and the abutment teeth, and others, had been opened up and treated without results. The patient was referred to me for consultation and a small portion of a lateral root was located and removed, with prompt relief. This root was removed with the bridge in position.

Another interesting case was a lady 45 or 50 years of age, and the wife of a physician. She was in an extremely nervous condition and both she and her husband were greatly worried over her trouble, which had existed for more than 10 years. Her teeth had all been extracted about 10 years before and she was wearing full upper and lower dentures. While she was of a positive nervous temperament, yet her condition was greatly aggravated on account of her neuralgic condition. She had been operated and had received constant medical attention to correct her nervous trouble, but without benefit. An inflamed area developed under her upper plate in the bicuspid region and they were fearful that it was of a malignant origin. Two or three dentists had been consulted but had been unable to diagnose the case and this further tended to disturb the patient and her husband. The region referred to was highly inflamed but upon careful examination I found a minute opening, which was probed some distance to a point where a root of a tooth was detected. This was removed without much difficulty and proved to be an extremely small portion, not much larger than the lead of a pencil and only about one-quarter inch in length. A note from her husband, some weeks afterwards, advised that his wife had been immediately and entirely relieved from her pain and that her nervous condition was greatly improved.

Dr. W. I. Jones: I want to compliment Doctor MacMillan on his presentation of this subject. I seriously doubt, however, the probability of there being any pus or abscessed pockets in the upper or lower jaw bones after six or seven years. If there is a sinus present, I do not see how it would be possible to have a case of true tic douloureux referred to one of those pus pockets. I wonder if there was really pus in those pockets.

Doctor Brophy: I have enjoyed the paper very much, and especially that part of it that has to do with care in making records; the system of doing things methodically. Summing up all that has been said by the essayist and those who have spoken, I have endeavored to get at the essence of it, and if I have interpreted their statements correctly it means that trifacial neuralgia is a condition which has for its origin a local irritant. Some may say that specific diseases, malaria, mineral poisoning, etc., could not be regarded as local irritants. Yet I have seen some of the most extreme cases of trifacial neuralgia due to the presence of tape worm, and which would of course be reflected pain; nevertheless there was a local irritant at a point quite remote from the site of the pain. And the removal of the tape worm cured the neuralgia. In one case a man insisted upon extraction, and his teeth were sound. So far as I was able to determine, there was no disease of the teeth at all and it so proved. The advent of the Roentgen photograph has cleared up many of those conditions which prior to that time were regarded as obscure and due to some mysterious systemic condition. I am not one of those who believe that in any great number of cases neuralgia is due to some mysterious cause. The condition is almost always due to a local irritant, but we do not locate the local irritant and we think it is something we cannot reach. The anemia which comes from a disease will be followed sometimes by pain. The presence of an artificial denture in a dentulous mouth will cause neuralgia, and the patient will insist the same kind of neuralgia in the toothache which she had before the removal of the teeth, because the dentist hasn't used the proper care. Parts of a plate may cause extreme pain. These cases the essayist related where pain was relieved by pressure is a good deal like making use of local anesthetic. The pressure of water in a hypodermic syringe will bring about cessation of pain. After all, the substance of the matter is that trifacial neuralgia, with rare exceptions, is the result of some local irritant somewhere, and the Roentgen photograph reveals the center of disturbance and the cases told of by the essayist shows that local irritants were the cause. Prior to the days of the X-ray, this was not realized. With this and the research done by our young friend, who is doing it so well, I think the subject of trifacial neuralgia will soon become very clear.

Doctor MacMillan (closing): In the first part of my paper, to meet some of the criticisms, I said that obscure neuralgic pains might come from an irritation to any branch of the fifth nerve. Any abnormal condition of the jaw can cause neuralgia, and if you trace out the intricate mechanism of the fifth nerve right down through the lumbar cord, where we get beautiful reflexes, we can explain cases, as Doctor Brophy has said, where tape worm or ulcer on the uterus or gastritis will cause these pains. It proves that there is no such thing as an idiopathic disease; that for every disease there must be a cause. I have had cases where impacted teeth, pus conditions, roots, pressure of plates, etc., have caused reflex pain, but what I am discussing mostly are these conditions which we cannot see, or are so obscure that we have to make use of rational methods of diagnosis. As to the definition of tic douloureux and trifacial neuralgia, we will find that every authority differs. It has been my experience that the supposedly incurable cases of neuralgia are classed as tic douloureux, but if a cure is finally accomplished then the original disease was merely an obscure neuralgia. I thank you for your complimentary remarks and am greatly encouraged to further pursue work in this subject. I could report on only four cases caused by this peculiar lesion because they are very rare. The fact that the patients were cured by these very simple operations seems incredulous, but if these areas did not cause the pain, why is it that the patient was cured after the area was curetted and properly treated?

THE VALUE OF STANDARDS AND RECORDS

BY CHARLES M. BALDWIN, D.D.S.

The incentives that to a very large extent urge men to greater achievement are hope of financial reward, positions of honor, or medals indicating their feats of skill, strength and courage.

The runner with a record of ten seconds for the 100-yard dash trains the more carefully because he knows others have established a record of nine and three-fifths seconds, striving not only to win that particular race but to improve his own record as well.

Record breaking has been a common occurrence of recent years, due either to improved conditions or to superior skill, strength or knowledge.

Standards of silicate work that were quite acceptable years ago have been surpassed by the combination of improved materials, equipment, technic and skillful manipulation, together with greatly increased confidence caused by successful results.

Knowledge as to how high standards have been attained in any professional work is necessary to demonstrate that they are possible, to compare our results with them and realize how much less successful our own efforts have been so that we may learn the means, methods and details that the most successful operators have employed in producing the highest standards. Failure to realize the high standards that have been established really is more serious as a handicap to advancement than knowing such facts but being uninformed as to how they were made.

The possible success of silicate fillings is unknown today, but the best results known are so much superior to those of the average user, or average result of each user, that every one using silicate cements should be ambitious to excel his past efforts and results.

The best results will be produced only by intelligent selection after careful comparison of materials, equipment and methods, continued thoughtful study, keen observation and sufficient repetition of operations to develop the strictly professional knowledge and skill pertaining to such operations.

The knowledge of remarkable standards of success established by users of Ascher's Enamel is constantly becoming more generally known, which must stimulate and encourage others to try and produce equally good results.

Expert users of gold foil have established both the technic and standards by which gold fillings are judged, while the general mass of dentists have been considered skillful in proportion as their work approached these standards.

The same principle is known and accepted in every kind of dental work except the silicate type of filling. After more than ten years' use of silicate cements it is almost impossible to find records of the most successful methods or standards of success with which other users could make intelligent comparison.

Until such standards are more generally known, it makes it exceedingly difficult for users generally to know just how many of the defects seen in each individual's work may be caused by a weakness of the material as originally made, or by deterioration which may or may not be prevented, or entirely by lack of knowledge, skill or equipment of the operator.

Filling materials are valued according to the best total results established, while the individual using such materials is honored deservedly by the profession in proportion as his results are known to reach the highest proportion of success.

Comparisons must be made and results must be known in order that the values of materials, methods and personal skill may be determined. This strictly professional feature has been almost entirely absent during the entire history of silicate cements.

One or more causes precede an effect, and the *principle by which cause produces effect* must be known; otherwise one can not work intelligently.

To an astonishing extent dentists have attributed defects to materials, when a broader or more successful experience would have clearly demonstrated that such defects were caused by something easily preventable by the user, whose knowledge and skill were sufficient to enable him to control and eliminate the cause.

The possibility for personal conference is so limited that successful users of silicate cements should make reports of their results and the means employed to produce them in such a manner that, regardless of location, all dentists may be benefited by the successful users in Boston, New York, Chicago, St. Paul, New Orleans, San Francisco, or any other place, large or small.

True professionalism demands this clinical feature in every kind of work so that practical every-day results may be properly examined and critical analysis determine comparative value.

ACCURATE, RAPID AND EASY LABORATORY METHODS

BY I. J. DRESCH, TOLEDO, OHIO

(Concluded from page 377, May Summary)

PARTIAL DENTURES

Probably the greatest stumbling block for the average dentist is the making of partial dentures. Most of the trouble is caused by the natural recession of the gums and the consequent settling of the denture. Often the denture will settle more at one point than at another, resulting in unequal pressure when the jaws are brought together, which action causes the denture to rock, and in some cases its entire displacement. This trouble can be remedied to a great extent when the teeth are set up if proper care is exercised. Ascertain the approximate amount of recession of the gums and ridges, and make allowance for the amount determined when the teeth are set up.

To illustrate: Partial upper and partial lower dentures are to be made for the same mouth. It is determined that the upper gums will recede one thirty-second of an inch, after denture has been worn a given period, and the lower ridge will recede one-sixteenth of an inch in the same time. The casts are then placed on the articulator as usual and the teeth for the upper denture placed in position, and articulated with the lower natural teeth, which have not been allowed to strike the natural teeth of the upper jaw, the articulator being opened the amount it has been determined the upper denture will settle, or one-thirty-second of an inch. When the upper teeth have been thus placed, the articulator is opened the second time to allow for the shrinkage of the lower ridge, or one-sixteenth of an inch. The lower teeth are placed so as to occlude with the teeth of the upper denture and natural teeth.

In cases where a partial set, either upper or lower, is made singly, the amount of recession is determined as usual, and the natural bite opened to that extent on the articulator, the teeth set up to occlude with the natural teeth of the opposite jaw.

When a full upper and a partial lower are being made for the same mouth, the teeth of the upper denture are arranged first with the articulator at normal occlusion. The upper teeth having been placed, the articulator is opened to the extent which it has been determined the lower denture will settle and the teeth for the lower partial are placed to occlude with the upper denture. In case of a full lower and partial upper denture being made, the same method is used except that the teeth for the lower denture are placed first.

After inserting partial dentures made in this manner, the separation of the natural teeth should be explained to the patient, which will not only allay any apprehension but as a general rule will secure the valuable co-operation of the patient. The patient should be requested to call for an examination as often as possible, and at least every ten days. If, at the end of a reasonable length of time, the dentures have not settled enough to allow proper occlusion, they may be ground to normal occlusion very easily. In some cases the dentures will settle more on one side than the other, in which instance the frequent visits of the patient will be helpful in that the condition may be remedied as it appears.

ARRANGING THE TEETH FOR METAL-CAST-TO-TEETH DENTURES

Metal dentures that are cast direct to the teeth require a different procedure in arranging the teeth than is used for vulcanite work. It is a well-known fact that porcelain has a marked tendency to expand when sufficiently heated, and this condition must be kept in mind when the teeth are arranged. Metal, especially aluminum, has a tendency to shrink when cooling; this also must be remembered. To allow for the expansion of the porcelain the teeth should be set one-thirty-second of an inch apart. To prohibit the metal crushing the teeth, it should not be permitted to encircle them, and for that reason all wax should be carefully removed from between the teeth. It is best to place whiting between the teeth before flasking; this may be done by painting it in place by means of a small camel's hair brush. The whiting will not only confine the metal but also act as a cushion, allowing the porcelain to expand.

It is important that these instructions be carefully followed if perfect results are to be had. Many cases where the teeth have been most carefully arranged with regard to the expansion of the porcelain have been ruined because of failure to provide for the contraction of the metal. Indifference will most surely be followed, in every instance, by checked teeth.

GUM BLOCKS

Gum blocks or sections, though a bugaboo to the average dentist, are not extremely difficult when the proper method is used for their arrangement. Before crown and bridge work had become popular, dentists were exceptionally skilled in the use of gum blocks, but in recent years their use has become almost a lost art. It is to be deplored that this most esthetic of dentures is so infrequently made, and in view of the many improvements the manufacturers have made in laboratory appliances, especially electric engines, there would appear to be no reason why the popularity of gum blocks should not increase.

Occasionally there are cases of irregularly-shaped jaws which make it extremely difficult and sometimes impossible to use gum blocks. For such a case, Gould's Natural Gum Rubber Facing is an ideal substitute for the unnatural and unsightly pink rubber, which is too frequently used.

Extreme care should be exercised in the selection of gum blocks, and the mold which most nearly corresponds to the contour of the model should be used, thus greatly facilitating their grinding or arrangement. The selected blocks should be set on the wax base before being ground, this approximate arrangement giving a fairly accurate idea of the amount of grinding necessary. A quick-cutting stone is preferable when grinding the blocks to place, after which a very fine stone should be used to smooth the roughened edges. To avoid checking the blocks during grinding, the stone may be kept cool by moistening a sponge and placing it in contact with the stone. Commencing with the two anterior sections, the blocks are ground to place on the coarse or quick-cutting stone. The central joint between the two anterior sections must be ground with absolute accuracy, as it will be extremely difficult to change them later without rearranging the entire set. When grinding the blocks they should be held at an angle of forty-five degrees, with the face of the block uppermost, thus forming small V-shaped openings between the sections, which should be filled with cement when the case has been flasked.

When the blocks have been ground to place on the coarse stone and it is determined that their positions are correct, one at a time, beginning with either anterior block, their rough edges are made sharp and definite on a very fine stone. After the case has been flasked and the wax scalded out, the half of the flask containing the gum blocks is placed in boiling water for two minutes, or the length of time necessary to make a thin mix of cement. The cement ready, the flasked case is removed from the water and the cement placed between the sections, the heated condition of which will draw the cement and completely fill the V-shaped openings made for that purpose. It is a good plan to let the flasked case and cement stand over night and thoroughly harden before packing and vulcanizing. Sufficient flood-gates should be made in the plaster to allow easy escape of surplus rubber, and a minimum of stress on the gum blocks when the packed case is pressed. Do not remove from the flask while warm, and let the flask cool slowly.

MAKING VULCANITE DENTURES WITHOUT SANDING OR SCRAPING

During the vulcanization of rubber it acquires a glazed surface which is hard, dense, elastic and proof against the infiltration and retention of septic matter, which, by fermentation, causes heat and the consequent irritation and inflammation which follow. Therefore, when a vulcanite denture is made without sanding or scraping, time is not the only thing saved, but the toughest, hardest, most elastic and sanitary portion of the vulcanite also. There are many, no doubt, who would spend time and money to secure these features in vulcanite dentures, but peculiar as it may seem, they can be had with less time and less money than it takes to make a much inferior denture without them.

After the case has been placed in the lower half of the flask, the plaster is nicely smoothed and allowed to become hard. For a perfect separating medium for this work, Castgloss is far and away above any other material, and is almost exclusively used in the large commercial laboratories where the highest efficiency is necessary. When the plaster in the lower half of the flask has been painted with Castgloss, the plastei for the upper half is poured in slowly, and to insure having a smooth mold, which is necessary if a smooth denture is to be had, the plaster for the upper half is rubbed with a finger against the waxed-up denture. If this is done carefully it will be surprising to note the smoothness of the plaster mold.

Dry heat should be used for separating the flask, which should not be allowed to become so warm as to melt the wax therein. Should the wax melt, the porous body of the warm plaster will absorb it, which action would make it impossible to fill the pores of the plaster with Castgloss, which is absolutely necessary if the case is to be made without sanding or scraping. The wax removed from the separated flask, both halves of the flask are scalded until all trace of the wax has been removed. While the plaster mold is still quite hot, it is coated with Castgloss, which is quickly absorbed by the hot plaster, completely filling the pores.

As Castgloss is used only to fill the pores of the plaster, and not as a surface coating, the surplus Castgloss should be removed with cotton batting, one minute after it has been applied. To prevent the plaster cast adhering to the vulcanite, the model is treated with Castgloss in the same manner as the plaster mold, which will not only facilitate the removal of the plaster from the vulcanite but also impart a smooth, glazed finish to the palatine surface of the vulcanite, which will not retain filth and which can be easily cleansed, making it more tolerable to the tissues of the mouth.

A denture made in this way will present a smooth, glazed surface when removed from the flask, and the work of finishing be lessened greatly. A small amount of thin pumice mix will do all the work in a few minutes. As scraping is done away with, the case may be waxed much thinner than when otherwise made. Castgloss is especially helpful when gum festoons are made in the vulcanite. In such cases the festoons are made in the waxed denture, and by using Castgloss in the mold, the delicate festoons are retained perfectly during vulcanization, and scraping being unnecessary, it is quite easy to polish the glazed surfaces of the festoons without danger of destroying their contour.

THE "JUMP METHOD" OF REMAKING DENTURES

The "jump method" of remaking dentures is not only a big time saver but also a very efficient means of reproducing a denture that has become a misfit through absorption of the alveolar ridge. The "jump method" is also indicated when a denture is so badly broken or the vulcanite so weak as to be impracticable to repair.

The method comprises three ways of remaking dentures, each of which is especially suited for its especial purpose. The method of which the most use can be made is that indicated when a denture has become a misfit through absorption of the alveolar ridge. The technic of this method is very easy to acquire. With a mechanical saw the entire palate of the misfit denture is removed, leaving a margin of rubber extending one-quarter of an inch lingual to the teeth. If the gum facing is too prominent for perfect facial expression, as in cases of temporary dentures, it should be removed in like manner, being careful to remove all vulcanite from between the necks of the teeth. If, however, the gum facing is in harmony with the features of the patient, it may be left intact, filing away an eighth of an inch of vulcanite at the extreme periphery.

In either case the vulcanite with teeth attached can be easily attached to the alveolar ridge of the plaster cast, the tuberosities and frenum acting as positive guides for its placement. The teeth thus placed on the cast, they are securely fastened with sticky wax, wax palate placed in position and new gum facing waxed in position, or wax addition made to vulcanite gum facing. The case is then flasked as usual, separated, and all vulcanite coming in contact with the cast is roughened with a bur, to insure the adherence of the new rubber, which is then packed in the usual manner. In case the gum facing was not removed, it will be unnecessary to use pink rubber, but allowing the base rubber to come over the periphery of the old facing, which has been previously prepared by filing.

Another more simple method, for the same case, is the "plate impression method," which, however, is impossible in cases of over-hanging ridges and consequent undercuts in the denture. The ideal case for this method would be a denture without undercuts, which is perfect in every way except that through absorption of the alveolar ridge or some other reason, the fit is not perfect. The name is descriptive of the method; a small amount of plaster is painted over the palatal surface of the misfit, and the old denture acting as the tray, an impression is taken. No more than a sufficiency of plaster should be used when the impression is taken.

The plaster-coated denture ready, it is firmly placed in position, and the patient instructed to bring the jaws together, and the articulation verified. The action of the patient, by bringing the jaws together, gives an impression taken under normal biting stress, which will be helpful in retaining the finished denture.

The impression thus secured is then coated with Separlac and cast secured. The plate impression is then removed from the cast but immediately placed back in position on the cast. The purpose of its removal is merely to insure its easy removal from the cast, after it has been flasked. The denture in position on the cast is flasked the same as a fully waxed case and allowed to stand in hot water for a few minutes, which will aid its separation. The plaster used for the impression is then removed from the vulcanite, the entire palatal aspect of which is then roughened with a bur. Sufficient rubber is then placed so as to take the place of the plaster used for the impression, and the case vulcanized as usual. When vulcanized, and removed from the flask, brush the discoloration from the old vulcanite, and the denture will be ready for wear.

When a case is presented, the fit and articulation of which is perfect but the vulcanite of which is beyond needed repair, a simple "jump method" is to place the loose teeth or broken parts of the vulcanite in position, and using the old denture as an impression of the case, secure a model of same. If advisable, the plaster cast may be scraped at the periphery of the gum margin, to allow for any shrinkage of the tissue. The denture is then placed upon the model of itself and made secure with sticky wax, after which it is flasked the same as a fully waxed case. The flask may be heated sufficiently to make its separation easy, and the old vulcanite removed by heating with a blow pipe. The case is then packed and finished in the usual manner.

THE "JUMP METHOD" OF REMAKING WATT'S METAL BASES

The "jump method" of remaking Watt's metal bases is indicated when a base has been imperfectly cast or has been broken in finishing. The method is also indicated in cases where the metal has been cast direct to the teeth, the technic being the same as when the base only is being remade. The first step is to place the broken parts in position and securely fasten with sticky wax, after which a model of Imperial Investment Compound is made from the base. Any necessary wax additions may be made after the model has been poured and the case invested in the usual manner.

The invested case should be placed on a slow fire and left until all trace of moisture has disappeared. When put on the fire, the flask must be placed in such manner as to make impossible the escape of the metal which melts at a low temperature. The case thoroughly dry, enough metal to fill up the sprue holes is added to that in the flask.

METHOD FOR RESWAGING ALUMINUM BASE

Imperial Investment material is used for making a model of the case, which is placed in the lower half of an ordinary flask. All undercuts in the cast are filled with wax, and to facilitate its separation, it is coated with Separlac before the upper half is poured with the same material. The metal base is then annealed, placed on the model in the flask, the upper half of flask placed in position over lower half, and the flask placed in a press and slowly brought together. This will have conformed the base perfectly. except the undercuts, which are remedied by removing the wax, and using a horn mallet to tap the metal to place.

CAST BASES OF WATT'S IMPROVED METAL

Watt's metal, the product of Dr. George Watt, under whose name it has been sold for many years, has many advantages over vulcanite as a material for lower dentures.

It is stronger, runs sharper and withstands chemical action in the mouth better than 18-karat gold. It gives a much better fit than vulcanite or gold and is a good conductor of heat and electricity.

Like other products of known worth, Watt's metal has many imitators. To insure getting the genuine, ask for Dr. Watt's Improved Metal and accept no other.

The first requisite to success in the casting of Watt's Improved Metal is a perfect material for the model and investment. The non-shrinking, non-checking, quick-heating and fire-proof qualities of Dr. R. C. Brophy's Imperial Investment Material make it an ideal preparation for the casting of Watt's metal.

Upon the model the desired length and depth (labio-bucco and lingual), of base plate, is outlined with an indelible pencil so as to be clearly seen through the light colored wax which is used. The light colored base plate wax is then adapted to the model and by means of the pencil line is accurately trimmed at the edges. (It is well to bear in mind the finished casting will be a duplicate of the waxing, and care in the waxing will save time in finishing.)

When a base only is to be cast, a small margin of base plate wax is fashioned around the entire base plate, at the extreme edge. If an extra heavy base is wanted, the edge strip may be made heavier at the posterior lingual aspect of each side. The wax is then stippled, or otherwise treated, to make a firm anchorage for the vulcanite on the finished casting.

The wax case is invested in the Watt's Improved Molding Flask, being invested the same as for a vulcanite base. After separating the invested case, grooves are cut in the investment in such manner as to form continuous sprues, connecting the heels of the base plate with the sprue holes made in the flask. All wax and small particles of the investment which have been loosened in cutting the sprue holes, should be carefully removed and the flask fastened tightly together with the bolts made for that purpose.

Two hours should be the time given for the investment to thoroughly dry. A good test for determining the presence of moisture is to place a piece of plate gold over the sprue holes and if present, the moisture will condense on the surface of the gold.

The flask should not be allowed to become red hot; 300 degrees is sufficient heat for casting, as it is only necessary that the flask be hot enough so as not to chill the metal when poured in the mold. When ready to cast, the flask is placed with the sprue holes pointing upward, being held in position by the handle made for that purpose. An ingot of Watt's Improved Metal is placed in the ladle and held over a fire until one-half is melted, when it is removed and the heat of the ladle is allowed to melt the remainder. The molten metal is immediately poured slowly in one sprue hole, until the mold is filled and the metal is seen in the opposite sprue hole.

The cast metal should be given at least one hour in which to cool. Do not jar the flask until the metal is hard and the flask cool enough to be handled with bare hands. Do not place the flask in water to cool; it will cause the metal to be more or less brittle.

WATT'S METAL CAST DIRECT TO THE TEETH

The technic for casting Watt's Metal direct to the teeth is the same as for a base plate. To insure against checking the teeth, it is well to place them slightly apart and fill the spaces with whiting before flasking. Be careful to wax smoothly and thus make the finishing easy. Should it be necessary to file the metal, it may be scraped or sanded, and the scratches removed with powdered pumice stone and a felt cone or wheel. By applying whiting with a soft cotton buff wheel, Watt's Improved Metal takes a very high polish.

TO SAVE OR NOT TO SAVE

BY DR. JAMES F. HANNON, TOLEDO, OHIO

Considerable is being said of late regarding the conditions of our root canal technic. Joint meetings of the dentists and physicians are being held and the physician is told of the deplorable state of our root canal preparation.

He is told that, by our present system of treatment and by the use of many of our canal filling materials, focal areas of infection are established about the apices of the filled roots, and that this condition has caused havoc systemically to the patient.

In these discussions much is being said about how poorly this work has been done, and the dentists are admitting that they are not satisfied with their own work and do not feel equal to their duty.

In fact, it has been said that there are but few men in every community who can properly treat and fill root canals. It would seem, then, that the efforts of the profession in their study, experience and observations have been in vain; that after establishing an aseptic condition in their efforts to maintain this condition, a highly infective condition has been set up by the use of drugs which, until this time, have rendered very valuable service to dentistry, but alas, it has all been in vain, and we must seek other methods in justice both to the profession and the patient.

We are told in these joint meetings that these teeth "can" be saved by the abandoning of the filling materials most used today in our root filling. Our brother physician it would seem, will get the idea that we cannot devitalize and fill nerve canals without the chance of impairing the general health of the patient. In that case, the physician will consider extraction as the only safe way of insuring the general health of the patient, since we are not equal to our work.

Should the dental profession be forced into bad repute in the eye of the physician in this way? When we honestly know that thousands of root canals are filled annually and we are not producing infections, but are rendering the services made possible by devitalization and root filling?

As the profession must go on saving teeth why, then, should we stir up a condition which will hinder the work we must do, and also produce wrongly advised conditions which will mean extensive extractions (loss of human tissue) to a very great extent?

PRESIDENT'S ADDRESS*

BY CHAS. A. BURBRIDGE, D.D.S., GRAND RAPIDS, MICH

MANY VITAL AND SPECIFIC CHANGES have been wrought in our civilization since the advent of man upon earth—the results of which are, to a more or less extent, only today becoming appreciated. In the beginning, individualism was the predominant factor. Man sought to acquire for himself alone, and his every effort was to protect and retain such acquisition. Out of individualism grew the first or primitive forms of social organization, stimulated by a knowledge that in union there was strength and through the various stages of development the present high plane of civilization has been reached. Intellectual advancement is varying and of perpetual accumulating power and is simply the expression of civilization, and civilization advances with the disposition to doubt and to investigate. Guizot has very aptly attributed the growth of civilization to the nature of individual and social development through the accumulation of useful material and the today's standard of civilization has developed through man's ability to acquire, retain, and use knowledge.

We today are gathered together upon the occasion of the fifty-ninth annual meeting of the Michigan State Dental Society for the purpose of acquiring, retaining and using knowledge related to our chosen vocation—a perfect expression of the progress of civilization and a proof conclusive of our belief in the strength of organization and the individual benefit to be derived from social contact.

As your president, I bid you welcome and trust that your belief in such as this program which shall follow, may be rewarded by the acquisition of knowledge that shall spur you on to the greater things, and from which shall emanate the continued progress of our beloved profession which has so dominated it in the past.

This great branch of the healing art—dentistry—has experienced all of the changes which characterize evolution and progress in all of man's great undertakings. From the writings of Hippocrates we glean many evidences of operations upon the teeth, crude and unscientific, yet showing the individuality of dentistry as a branch of the healing art. Hippocrates' work along this line was indeed antedated by the early Egyptians, and yet this great man made many discoveries, and had the courage to proclaim them to a doubting and superstitious populace, which were foundations for modern scientific research. Early Roman history gives us record of dental operations and the works of Cicero make frequent reference to this branch of work. Early Phœnecian, Arabic and Syric translations tell of the filling of teeth and placing of artificial work in place of lost structures. And so from these early historical beginnings we have all the way down through French and English history the records of the various discoveries and practices which have laid the foundation for our modern science. Many great men have sacrificed their time, energy and ability to further relieve the ills of the mouth, teeth and gums, and have handed down to us their deductions and proofs to aid us in our promotion of this great good.

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*Read before the Michigan State Dental Society, 1915.

Our own great country has furnished many men of wonderful ability along the line of dental art—men whose names will stand forever among the honored and beloved of our great profession. The names of Greenwood, Flagg, Harris, Hayden and Kingsley will long remain reminders of the pioneer work done in dentistry in this country.

However, with all of our historical data of the great men and their great accomplishments for progressive dentistry in our great United States, we must not overlook the products of our grand old state of Michigan, and the men that she has produced, who have not only been a credit to our state interests, but who have occupied positions of prominence throughout the entire world of dentistry. The names of Fletcher, Whiting, Taft, Waite, Parker, Robinson, Holmes and Watling will ever remind us of those whose efforts were bent upon a higher standard, a larger scope for professional service and a better dentistry.

Michigan has always stood for the highest attainable standards in the matter of men, laws, technic, and everything that pertained to this great profession of ours.

It most naturally follows then that the Michigan State Dental Society should be one of the foremost organizations devoted to the development of the dental art in existence today and a glance at its record may not be amiss.

On the evening of January 8, 1855, in the offices of Drs. Whiting and Benedict, in Detroit, occurred the initial inception of our great society, and it has maintained a continuous existence since that time—a record of which we may well be proud. Probably the most potent reason for this wonderful record of existence is the standard which has maintained in this society ever since its origin. Nothing but advanced scientific dentistry has been allowed or fostered at any time—the very best obtainable was ever the creed of the grand old men who have served to lay the foundation upon which our society is built; until today we have a focus of dental technic and mechanical genius extant in our state which is second to none in the country. To accomplish such a condition has meant much sacrifice of time and thought on the part of those who have had at heart the welfare of the society. No great movement, no great accomplishment, is ever brought to a successful issue without such effort and we, as a society, should revere the works of those who have gone before and be thankful for the privilege of promoting such an organization.

The future of our society is obvious. But one factor can dominate it—progress. We cannot but progress as long as harmony and co-operation prevail. Our aim must be ever higher, our standard must be ever broader and bigger and in the words of Virgil, "*Sic itur ad astra*"—Thus is accomplished ascent to the stars.

Some suggestions which shall be offered for your thoughtful consideration may or may not meet with your approval. They will doubtless offer food for argument and if only that, they will have been worthy the citing. They will deal with the furtherance of dental education and the raising of the standard, with the promotion of public health, with the safeguarding the public, and with the closing of the gap and cementing the bond between parent and component societies, through means that may be adopted if your judgment so decides.

With the inception last year of the movement toward the procuring of a state lecturer on oral hygiene, our state took second place among all the states of the union in the carrying of dental education to the layman, and thus producing a much needed and entirely progressive support to the problem of public health betterment. This movement, now only in its embryo, must develop, must grow, must expand, if it is to be in keeping with other accomplishments for which this society stands sponsor. We, as individuals, are in duty bound to support it in every way possible. The way must be made open for the receipt of the education in which this movement shall result and I implore you individually and collectively, as an organization, to make the work of the dental hygiene lecturer easy through your co-operation and influence, and you may be assured that dental education in our state will rapidly assume unthought-of proportions.

Your co-operation with the State Board of Examiners is of considerable moment at this time. They are endeavoring to enforce the laws enacted recently, that a higher standard of personnel may be brought about in our state. Illegal practitioners of dentistry are being summarily dealt with, thereby improving the conditions throughout the state and protecting the public. Funds are necessary to carry on such a work and a prompt payment of annual registration fees will greatly supplement the work of the Board in their task.

The scientific research committee of the National Society is doing a wonderful work. Their developments along scientific lines are beginning already to be strongly felt. The fund which makes such a work possible is in a receptive mood. Your co-operation is solicited and should be freely given. This is one of the greatest marks of dental progress and cannot but be of inestimable value to the profession, as well as to the public at large. No great work, however, such as this research committee is doing, can survive without the support and sympathy of the great body of men who are interested. These men who are giving their thought and energy need our backing—they need our co-operation, and we members of this society should stand at the call—ready to lend a hand wherever and whenever the opportunity presents.

Some few months ago at a meeting of medical men in the city of Chicago, Dr. Horace D. Arnold, of Harvard University, recommended intermittent examination of medical men as a safeguard to the public, and means whereby the standard of the medical profession might be raised. This, coming from a man of Doctor Arnold's standing and ability, would seem worthy of some consideration. Would it not be applicable to the dental profession and would it not promote a much greater interest in dentistry from a scientific standpoint and at the same time make men better able to cope with the ills of the mouth, teeth and gums—thus materially strengthening the cause of health betterment?

The subject of compulsory legislation for the administration of dental services upon poor children should rightfully come before this society. Much opposition is encountered among parents of poor school children toward the services of free dental clinics and children are allowed to grow up under most adverse conditions of development both mentally and physically, even though means are provided for correction of these conditions. Laws should be enacted to compel parents of such children to take advantage of these facilities and give to the child the opportunity to develop along natural lines. I would suggest that a committee be appointed from this society to investigate this matter and take under advisement the best possible means of bringing about such compulsory legislation.

A suggestion for your careful consideration and thought and which has personally been under advisement for some time, follows. It is the advisability of a society magazine. Your first impression of this matter may be that such a move is out of consideration, due to the enormous amount of time and labor consequent upon such a thing in order that it might be consummated successfully. Work is just the thing we need, however. Our duty lies further than our own private door. If through any means whatever we may help to better the profession—give to our society a means for better handling of proceedings—give our component societies an organ which may successfully develop their individuality and increase their personal interest, and that may, if properly conducted, provide a substantial financial income to the treasury through advertisement and subscription—it should be a consideration. We, as dentists, should co-operate in such a movement and avail ourselves of the opportunity to work for such a plan. No man can be too busy to give some of his time to the promotion of a better dentistry—no man can afford to allow anyone else to do more than he toward the furtherance of any progressive movement—and this presents an opportunity. This magazine should properly be a quarterly, managed by a board of directors, say five men, elected by the society and chosen from a list submitted by the combined district societies, their ratio of number to be same as the governor's list for State Board appointment. A managing editor is to be elected by this board and responsible to it. All financial matter to be under supervision of state treasurer—such as handling and disbursement of all moneys. All subject matter to be submitted to strict censorship. Proceedings of state meetings to be preserved permanently through this means—our own stenographer, supported by the magazine, doing the reporting. The board of managers to be co-operative with state editor of transactions. This plan would necessarily call for a new committee in our list of the president's appointments, to be known as the magazine committee, which committee might be utilized as the censor for all subject matter.

Whether this plan meets with your approval or not, or whether it is adopted and carried out, is a matter of the future, but suffice to say that other state societies are doing it, and successfully. Michigan's society should not be trailing in any progressive movement and it is here presented in the hope that it may receive your careful consideration.

A further suggestion which would only apply to our program arrangement is presented—namely, the affording of extended time to the report of the various committees, especially the oral hygiene committee. Your president would suggest that this report be given a more exhaustive consideration, even to the extent of illustration. This subject is important and should be given more time on our programs.

The National Society is now flourishing. The magazine comes to you, a finished product perhaps not perfected, yet a splendid example of national progress. The society needs your support. Your attendance upon meetings is of importance both from the standpoint of the support which the society courts, and from the standpoint of the personal good which you may derive through your attendance.

Next August will witness in San Francisco probably the greatest dental convention that the world has ever known. The committee in charge of the Panama-Pacific Dental Congress is doing a great work. They are supported by executive committees in the various states, and this great body of men are endeavoring to complete an organization which shall result in upwards of 10,000 men, all interested in the perfecting of the dental art, getting together for a few days of consultation. Can anything more attractive or more beneficial be conceived? We all should have a personal interest in its success. Everyone who can possibly arrange to attend should do so and those who find this impossible should at least avail themselves of the opportunity to procure the proceedings of the meeting, which are to be incorporated into a volume, the presence of which should not be lacking in anyone's dental library. Michigan's executive committee is anxious to have a proper representation and your membership is earnestly solicited.

The foregoing suggestions are submitted for your careful consideration. Should they appeal to you as worthy, adoption of them will be in order and should they not be feasible, seed may have been sown which shall bear fruit at some future time and our society be strengthened thereby.

Our program this year is of that superior quality so characteristic of Michigan's contributions to dental science. Our guests are men capable of giving the best known in the several branches of work. We appreciate the courtesy they have extended to us in coming from far distant cities to meet with us and share their knowledge and valuable experience that we may profit thereby. We welcome them and would wish to express that deep appreciation and heartfelt thanks we have for their interest in our society.

To the clinicians, who have so freely given of their support, and who have spent time to prepare clinics of such character and superior quality as their subjects show, we would express our sincerest appreciation. To the efforts of these men is due the success of our meeting—to them we are indebted for the advanced ideas and progressive influences which help us to make for a better dentistry and may we strive through our interest and co-operation to make them feel that their efforts have been fulfilled.

To the members of committees who have so ably carried on the work of bringing this meeting to a successful issue, I would personally express thanks. They have shown an interest and a willingness to support the many problems which are involved in the maintenance of a successful society, and their efforts are worthy of praise.

The society appreciates the work of these men, who have given of their time and energy in this way, and the Michigan State Dental Society owes its committee members a lasting gratitude and an expression of regard commensurate with their efforts.

Lastly, to the officers and members of the council with whom it has been my duty to serve, I would express my deepest feeling of appreciation. Their co-operation has been akin to brotherhood. Their assistance has been ever freely and fully given. It has been a pleasure to work with them and it is with the deepest feeling of regret that I give place to my successor and leave that close companionship and mutual love of man to man which exists between them. I would wish that each of us might experience the same influence that has been my good fortune to feel through the closer relationship which council service promotes. May the influence of these men be ever felt and may their works be richly rewarded.

In closing I would wish to express my deep feeling to the society for the great honor which you have bestowed in selecting me to serve you as president. The appreciation I cannot express—only to say, "I thank you."

CEMENT FOR MENDING PLASTER CASTS

BY W. BUZZELL, D.D.S., PORT CLINTON, OHIO

The following makes a reliable cement for mending broken plaster casts:

Dissolve celluloid in acetone to a syrupy consistency. Smear the fractured surfaces and press together for a minute or two. It dries quickly and holds securely.

Patches may be put in celluloid auto windows by moistening the surfaces with acetone and pressing together, leaving them transparent as before.

DENTAL SCIENCE AND LITERATURE*

BY RUSSELL W. BUNTING, D.D.Sc., ANN ARBOR, MICH.

AS WE GLANCE OVER THE DENTAL LITERATURE for the past year as it has appeared in the various journals of our profession, we find that there has been a consistent effort on the part of most editors to make their publications as readable and interesting as possible, and to encourage the dentists to read with some regularity. In the effort to do this, some of them have gone to extremes, so that their reading matter has lost all semblance to a scientific publication, and have taken on a style like that of an advertising medium. Be that as it may, the editor of the *Dental Cosmos*, in a recent editorial, bemoaned the fact that dentists do not read their journals, a condition which had been borne in upon him by a flood of inquiries for information regarding a new discovery which had been treated in full in the recent pages of his journal. And in this connection, he quotes a line or two, which is very apropos of the situation:

TOO BUSY TO READ

"An hour with a book would have brought to his mind
The secret that took him a whole year to find.
The facts that he learned at enormous expense
Were all on a library shelf to commence.
Alas! for our hero; too busy to read,
He was also too busy, it proved, to succeed.

"We may win without credit or backing or style,
We may win without energy, skill or a smile,
Without patience or aptitude, purpose or wit—
We may even succeed if we are lacking in grit;
But take it from me as a mighty safe hint,
A civilized man cannot win without print."

It has seemed to the writer that there has been an unusually large number of articles during the past year which have been devoted to special methods of practice or clinical procedure which are not possible to summarize in a report of this kind. Of these we will mention but two, of which one appeared in the *Journal of Allied Dental Societies* for March, 1914. This was a report given by Dr. Leon Williams of the work which he had done toward the standardizing and classifying tooth forms, looking toward a more intelligent manufacture and use of artificial teeth. He states that "two great defects have characterized the manufacture of artificial teeth from the date of their invention down to the present time, a conventionalized or generalized tooth form, devoid of definite character, and the absence of any system of classification or any fundamental principle or central idea on which the work is based." He tells how he set about the study of tooth forms in the skulls of the British museum, and how be became convinced that there was no foundation for the temperamental theory of tooth forms. Then follows a very scholarly and very interesting account of the avenues along which he carried his investigations, and the methods by which he arrived at his new method of classification. These he has placed in three groups, designated as Classes I, II and III.

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*Read before the Michigan State Dental Society, 1915.

"Class I is characterized by the parallel or nearly parallel lines which represent the proximate surfaces of these teeth for half or more than half of their length from their incisal edges. In Class II these lines converge so markedly that they would meet in most instances, at a point near the end of the root. These converging lines are sometimes nearly straight, but usually there is a very slight convexity of the mesio-proximal surface and a slight concavity of the distal surface. Class III, which I regard as the most beautiful form of human teeth, and which has rarely, if ever before, been used as a model for artificial teeth, is characterized by a delicate double curved line on its disto-proximal surface, and sometimes, though less frequently, on the mesial surface. All of the surfaces and angles of teeth of this class are more rounded and graceful than in either of the other two classes." This classification he applies more specially to the central incisors, but he says that the other teeth manifest these same characteristics to a less degree.

After showing a large number of illustrations of teeth and skulls, the author further states that the types of teeth are in a direct relation to the shape of the face and skull. That the square face should be accompanied by teeth of Class I, while the tapering face demands those of Class II, and the face with a curved contour is usually associated with teeth of Class III. In later work which Doctor Williams has done, he has attempted to perfect a method or rule by which the proper harmonizing tooth form may be determined for each individual face. This work without doubt is one of the greatest advances in dental prosthesis which has been made and should this classification obtain universal acceptance it will make the selection of proper tooth forms far more intelligent and true to nature than it has been in times past.

In this same field, Dr. W. A. Giffen has attempted to teach the principles of impression taking and plate making by means of the moving picture film. This was given before our own society at its last meeting, and was published in The Dental Summary for January, 1915. In it the author demonstrated the Greene method of impression taking which he had modified and had combined with other advantageous lines of procedure, making a very complete and intelligent presentation of the subject. This is probably the first instance on record in which a moving picture film has been used in the illustration of a dental operation.

As a result of a dispute between two dental manufacturers, two articles have appeared upon the subject of copper cements which are of interest to the profession. The first of these appearing in the *Dental*

Review for June, 1914, was written by Dr. W. V. Ames, in which he stated that no oxyphosphate of zinc cement containing copper was effective as a germicide unless it contained a high percentage of copper sufficient to make of the class of so-called "black copper" cements. He also objected to the claims which are made by the manufacturers of the "white copper" cements as to the efficiency of the mercuric iodide in such preparations. The basis for his statements is taken from experiments which he carried out by the classical method which W. D. Miller made use of many years ago, in which samples of various cements are mixed as for a filling and dropped into the surface of a layer of infected agar-agar in a petri dish. This is then incubated, and the relative efficiency of the cement as a germicide is measured by the distance to which the media about each pellet is kept sterile. In the experiments which Ames made there was a marked advantage in germicidal property of the "black copper" over that of the "white copper" cement, which he takes as conclusive evidence that the same relative values exist in their action upon the tooth tissues.

In an article entitled "The Germicidal Efficiency of Dental Cements," which appeared in the *Journal of Industrial and Engineering Chemistry* for March, 1915, Mr. Paul Poetschke who is now in the employ of the Caulk Dental Mfg. Co., attacked this problem in a different manner with strikingly different results. He cited the work of Ames and criticised the manner in which the experiments were conducted as not being a fair indication of the action of these products when introduced into tooth tissues. He then reported a series of experiments in which he made mixes of various cements, allowed them to harden and then pulverized them. The resultant powder was sifted and was added in definite amounts to samples of saliva. Portions of the saliva so treated were taken out after varying lengths of exposure to the cement and diluted, plated on agar-agar and incubated. He says, "Saliva is used in the tests since in this manner the various mouth organisms are used instead of a pure culture of one organism. Saliva is the proper media to be employed in tests of this kind, since it represents exactly the fluid with which the cements come in contact in the mouth. The exposure of masses of cement to ordinary culture media does not represent the conditions to be obtained in the mouth." The results which he has obtained by this form of technic he states as follows: "Caulk's White Copper Cement, Caulk's Red Copper Cement and Ames' New Process Oxyphosphate of Copper Cement are almost identical in germicidal power. Deciduo Copper Cement and Fellowship Oxyphosphate of Copper Cement require 15 minutes of exposure in which to secure the germicidal efficiency of the first named products which are obtained in only 5 minutes' exposure. This shows that the Deciduo and the Fellowship are both much weaker in germicidal power than these cements. Smith's White Copper Cement shows the lowest germicidal power of the entire series. He also states that the zinc oxide of the ordinary cements has a distinct germicidal effect and that this action is greatly enhanced by the addition of cuprous oxide, cupric phosphate and cuprous iodide.

It is evident that the variance in results of these two men has been in the method by which they carried out their experiments and any conclusion which is formed should be based upon the relative merits of the two methods to reduplicate conditions found in actual practice. It seems reasonable to say that in case these cements are placed in positions in which they are exposed to the action of the saliva the salivary test is more intelligent, but it must be remembered that this sterilizing virtue of cement when in contact with the saliva is dependent upon a chemical disintegration of the cement, which results in a loss of mass; the more stable the cement the less it is germicidal. And in case that the cement is placed beneath a tightly fitted crown, or under an impervious filling, the claimed superiority of the saliva test is not as well founded. It will be interesting to note the further developments of this controversy.

Perhaps the most important contribution of the year to dental therapeutics has been the work of Dr. Guido Fischer on Local Anesthesia in Dentistry. In the new edition of this work he further describes the technic of making injections with novocain in the production of "nerve blocking" and regional anesthesia. This method of producing anesthesia for dental operations has been received by the profession with a great deal of interest, but due to the fact that its successful operation demands an intimate knowledge of the anatomy of the head, the technic has not yet received universal adoption. A number of splendid papers have appeared, which have been written by men who have mastered the technic, and which set forth special details of its execution. Among these is that of Doctor Fischer himself, which appeared in the *Journal of Allied Dental Societies* for September, 1914. Also two papers by Dr. Theodor Blum, one of which appeared in the *Items of Interest* for March, 1914, and the other in THE DENTAL SUMMARY for February, 1915.

As an aftermath to the suggestions made last year relative to the efficiency of vinegar as a mouth wash, Doctors Lathrop and Gies report further work upon this subject in the *Journal of Allied Dental Societies* for December, 1914. This report was an account of a series of experiments made to determine if possible what the effect of the continued use of vinegar had upon the surfaces of the teeth. For this purpose several selections of sound teeth were submitted to these men by various dentists, which teeth were mounted in paraffin and were brushed daily with a brush and vinegar, half strength. Between brushings the teeth were covered with saliva and kept in a moist chamber. These experiments had been continued over the space of three months and at the end of that time no injury to the surface of the enamel could be noted. The work seems to have been executed with a great deal of care, but the time over which it has been carried is obviously too short to be accepted as a definite conclusion. It is also to be regretted that in this method no suitable control is to be had other than the memory of the original appearance of the enamel surfaces. Further work must be done along these lines before any conclusion can be arrived at.

Several articles of merit have appeared in the *Official Bulletin* of the National Association which have been largely reports of work done under the auspices of the research commission. Notable among these are the reports of work done by Dr. W. A. Price, which has been directed toward the perfection of a substitute for platinum to be used in dental operations. All indications point toward the early solution of the problem and the perfection of a new combination of metals which will be of great value to dentistry.

In the same journal issued October, 1914, Dr. T. B. Hartzell reported the work which he had done on the systemic effect of mouth infections. He cites a number of cases of severe disturbance of a general nature which plainly had their origin in an apical abscess or a pyorrhetic condition. He made cultures of 82 cases of abscess and found that among these 75 were streptococcus, of which 35 were demonstrated to be streptococcus viridans. The next most striking thing about the report was the causation of a diverse character of lesions in animals which were inoculated with the cultures made from these abscesses. The lesions occurred in the arteries, joints, kidneys and heart, which latter organ presented myocardial inflammation. The author says, "The analysis of this work points to the fact that the elimination of the principal foci, to wit, dental abscesses and pyorrhetic infection, is always most important and the first step to be taken in all cases, and vaccines are indicated only when elimination of the primary focus fails to give relief."

There have appeared during the year, in the *Journal of the American Medical Association* an unusually large number of papers having a dental significance. Among these was a symposium entitled, "Mouth Infection as a Source of Systemic Disease," which was contributed by Doctors Mayo, Rosenow and Billings. This article was reprinted in THE DENTAL SUMMARY for January, 1915. The text of this symposium shows very plainly that each of these men is thoroughly convinced of the importance of the mouth, the nose, and the throat as avenues of infection to the general system, and that they regard the infections about the teeth of special significance. Each cites cases in illustration of their views, while Rosenow points out that the reason why many autogenous vaccines fail may be that the character of the initial infection may have changed in the tissues so that the antigens prepared from the superficial organisms may not be efficient in combating the deeper infection.

Of all the subject matter which has been written during the past year, that which has received the most comment and has awakened the widest interest is the discussion of the entamœba buccalis as the cause of pyorrhea. From its first suggestion during the summer of 1914 to the present time there has appeared a flood of articles in the dental and medical journals, by members of both professions, and which has even been carried to the popular press, the Sunday magazines and the daily papers. No method of dental treatment or operative procedure has received such an enthusiastic reception or favorable comment since the announcement of the first Taggart inlay, and, indeed, this bids fair to outdistance even the cast gold inlay. Everywhere dentists who have been unsuccessful in their treatment of pyorrhea have hailed this new theory and its attending treatment as a great panacea for the relief of all such conditions.

It would be impossible at this time to give a complete review of all the literature upon this subject. Among the first to mention the entamœba buccalis was Angelo Chiavaro, who gave a paper before the American Dental Society of Europe, at Paris, in July, 1914. This was printed in full in the *Dental Review* for December of that year. In it Chiavaro reports that he has found the organism in a wide range of locations in the mouth, among which have been the pus of pyorrhetic pockets. He concludes as follows: "The entamœba buccalis gets in a state of encystment in the oral cavity; therefore it does not represent one of the stages of other entamœba, but a distinct form. The entamœba is found in the pus of all cases of pyorrhea alveolaris. It is generally present in the materia alba of the sound teeth if they are not kept in a good hygienic condition. The entamœba has not a pathogenic action; on the contrary it feeds on bacteria; it is most probably an aid to the auto disinfection of the mouth."

Simultaneous with this report, Doctors Barret and Smith announced that they had found the entamœba in a large number of cases of pyorrhea and that upon the administration of emetin hydrochloride, which is a specific for this organism, the entamœba disappeared from the pyorrhetic pockets and the tissues began to heal. This report was printed in the *Dental Cosmos* for August, 1914, and a later report by the same authors was made in the December issue of the same journal. The statements of these men are conservative in that they do not claim that the entamœba is the specific cause of pyorrhea but assert as their opinion that they are "immediate important factors in an overwhelming number of pyorrhea cases."

Immediately following this announcement of Barret and Smith, an article appeared in the New Orleans *Medical and Surgical Journal*, by Bass and Johns, who concurred with the findings of the first mentioned observers and later they contributed a report of a detailed study of the occurrence of the entamœba in pyorrhea in the *Journal of the American Medical Association* for February 13, 1915. In the latter article the authors prefix their remarks with the bald statement that "entamœba buccalis is the specific cause of pyorrhea." They describe the various types of organisms found and outline the method of treatment.

In the January 20th issue of the same journal, Doctors Evans and Middleton, of Madison, Wis., report a large number of cases in which the entamœba has been found in pyorrhetic pockets and give the results of injections of emetin hydrochloride. Many of these articles which have appeared in the medical journals have been reprinted in THE DENTAL SUMMARY for the benefit of the dental profession. A splendid resume of the recent contributions may be found in the Review of Current Dental Literature in the *Dental Cosmos*, for April, 1915, page 458, to which we would refer all who are interested in this subject.

In practically all of the reports of clinical experience with the use of emetin hydrochloride or other derivative of ipecac, there has been almost a universal commendation of the results obtained. Gums stop bleeding, pain disappears, and pockets about the teeth close up, so that many enthusiastic writers hail it as a panacea for pyorrhetic conditions. But withal it must be remembered that pyorrhea, as we know it, cannot be cured without the surgical removal of the various forms of deposits which have accumulated upon the teeth. No amount of medicament either general or local will render the roots of the teeth clean and smooth, suitable for the healing of the tissues about them. If then, this surgical procedure is carried out, we then have introduced the personal element in the matter in that we do not know how much of the beneficial result obtained may be credited to the drug administered and how much to the surgical work performed. It is significant to note that throughout all this comment and discussion the specialists in this particular branch of dentistry are continuing to treat and to cure pyorrhea as they have in the past by surgical measures alone, none of them as yet having reported any results obtained by the emetin treatment. We might also in this connection turn back but a year in our literature and find that it is full of articles and reports in which various men have been treating pyorrhea with seeming success by the use of autogenous vaccines. If the entamœba is the specific cause of pyorrhea, how came the vaccines made from bacteria to produce such specific results?

And further, it is interesting to note that an article appears in the *Medical Record* of New York for March 13, 1915, in which Doctors Wright and White report the successful treatment and complete cure of twenty-eight cases of pyorrhea by the injection of mercuric succinamid. This method and substantially the same statements are sent forth in the *Dental Cosmos* for April, 1915, by Doctor White. In all of this we may say that too hasty conclusions should not be drawn, but rather should we wait and weigh well the evidence that is before us, and remember that we are dealing with a disease which is amenable to and curable by proper surgical procedures.

A Dog's Bark

It has been frequently noted by aeronauts that the barking of a dog is always the last sound they hear from earth, and it has been discovered that this can be heard under favorable circumstances at an elevation of four miles.

ROOT TREATMENT*

BY THOS. P. HINMAN, D.D.S., ATLANTA, GEORGIA

THE ROSIN USED AS STATED this morning is the regular fiddle bow rosin. A question has been asked me with reference to treatment of teeth where we have a broken broach. I know of no way of getting out a broken broach, if it is in the apical third. The best thing to do with that broach, if the broach is sterile, as it should be, and the tissues are sterile, as they should be, is to leave it there. There is no objection to leaving it there. It is not an irritant, and the best thing is to let it alone. But you can take that thin solution of rosin and, after drying it out, can force it down beyond the place where the broach is broken, and you can also get the chloro-percha solution below where the broach is broken.

Air spaces must not be left in root filling. Care should be taken to see that the roots are filled solidly, because seepage occurs and if it gets into such an opening, you will always find septic matter. Haven't you frequently, in taking off a Logan crown, or any pin crown, had your drill suddenly drop down into a hole; you will always find septic matter in such openings. In practically every case you see where the apex is not well sealed, though the tooth is not giving trouble, an X-ray will show irritation in the periapical area. I want somebody to tell me how you can eradicate a blind periapical abscess. In discussing this with Dr. Clarence A. Grieves, of Baltimore, who is probably the best authority on periapical abscesses after whom I have read and with whom I have talked, he tells me there is no method whereby we can remove this periapical abscess. Why? We must remember the character of the tissues. We have in this periapical area the cancellous bone tissues, and the largest amount of lacunæ in the cementum. You will find little destructive processes taking place in the lacunæ, and the lacunæ become infected, and how can you get medicine to go in to produce a sterile condition? A case of that character I consider extremely difficult to handle and serious in its danger. This is the most serious form of abscess we have to contend with. It has no point of discharge, but the products of the abscess are absorbed in the system, and you will find in the next National Association Bulletin reports of two marvelous cases of Doctor Hartzell, of Minneapolis, working under the National Research Commission.

We have a blind abscess, and the pus is continually discharged into the system. We have the same infection of the cementum, and that infection will remain unless we remove it mechanically. What operation is necessary? A very simple one. The thing to do is to make a vertical incision in the gum over the apex. Some people use a horizontal incision.

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*The fourth of a series of post-graduate lectures before the Kentucky State Dental Society.

I make a vertical incision, and with a small fissure bur go in on one side of the root and simply cut off the apex. The apex is then easily removed and the bottom of the cavity curetted with a large spoon excavator. Then take a larger fissure bur and round the root under, so that no rough edges are left. What is the length of time we can expect such a tooth to remain in the mouth? It depends first on the thoroughness of the operation. The radiograph shows that the process of resorption that goes on attacks first the cementum and carries it off more rapidly than the dentine. So I believe if you cut off the apex successfully, and leave no rough edges, we have a good operation.

A MEMBER: What about the lead point?

DOCTOR HINMAN: I think if it can be introduced, and something used that will cling tightly around the lead, that success would be pretty well assured. But the reason I do not use lead is that I have no substance to chink up the holes. Between the lead and the canal cut off the apex, and then the curage, and then what? Some pack with gauze; but why, if it is a clean operation? After the curage and everything has been taken out, and we have the necrotic bone out, the next thing is to let the blood clot form, after flushing with normal salt solution in a syringe used with considerable force. Let the flaps come back, let the blood clot form, and let it alone. I have found the results better than if I attempted to pack. When you take out the packing and put another in, there is a great risk of forcing some more infection into that socket, even with the most careful manipulation. I had one or two cases where infection did come in. The tissues were held away by the packing, the blood clot was not allowed to form, and granulation took place in the bottom, but we could not get them to cover the base of the root. I had to extract them. After removing the end of the root, cleanse it, let the blood clot form, and let it alone.

In cases of periapical abscess, where we have a fistulous opening that has not stood too long, the amount of disintegration taking place around the cementum can be to a certain extent controlled by artificial means. The canal should be cleansed, washed, the fistula washed out first with normal salt solution. Following that, I somehow cannot get away from the old phenol. It is one of the old, true, tried friends that I still stick to; and force it through. I have never yet found a satisfactory substitute. Follow this with rosin solution, then the chloro-percha solution, and then in the pulp chamber put a piece of unvulcanized rubber and force the chloro-percha through the root and fistula into the surrounding tissues, and when it comes out on the fistula, hold your finger on the fistula and force it a little more, so as to spread it over the apical area. Then fill the root with a gutta percha point. That chloro-percha hardens, and it becomes encysted. In some cases I would force in the chloro-percha solution and then cut off the apex. That is, where there had been great resorption of the apex. It is possible from an infection around the base of a tooth to get the infection that produces pneumonia. If we fill the root canal, and it is not properly done, it is only a matter of time until we have a reproduction of the condition we had at first'

Some cases of blind abscess have been known to cause cardiac troubles and arthritis, and other diseases coming from infectious troubles. Where you have these large periapical abscesses, they are difficult to handle, and we make a great mistake in filling them too soon. In acute abscesses, where there is no destruction of bone, the case is entirely different. A man was sent to me who had been going down steadily; he had lost 25 pounds. I examined his mouth and found an area where the first bicuspid had been taken out and found a little pus pocket. An X-ray showed the cuspid abscessed. I said, "How long has that tooth been out?" He said, "Six or eight months."

He said he had noticed a discharge ever since the tooth was taken out, and coincident with that his health began to fail. In a case of this description the proper thing to do, and what I did, was to make a vertical incision and cut off the apex. The bottom of the socket was curetted. After a thorough curage was made and the apex cut off, I had to create a small amount of drainage because extensive necrosis had taken place. After I removed the cause, there was no discharge; there was no pus there, and the blood went in and filled the opening I had made and restoration began right away. I believe that man will get well without physical medication, because I have removed the source of the trouble, removed the infection that was destroying his health. In these cases we are the men to tell the people of their dangers. I would rather have two fistulas running in my mouth than have one blind abscess, because one is thrown off and goes into the stomach, and may make trouble, because the infection is thus carried into the system. When a fistula came through the cheek, the old treatment was to remove the tooth. I believe it can be cured. I had one case where the phenol was forced through the canal out onto the cheek, and then I forced through the chloro-percha. That case healed up; I am still watching it, and if I find any disturbance, I will go in on the side and take off the mesial root.

What I am trying to instil in you is that you attempt to open up and cleanse and fill your root canals more perfectly. How can you find whether a root canal has been punctured? Where a broach has been put in, and it goes to a certain point and the patient flinches, is it pulp tissue or has the canal been punctured? The X-ray will show if it goes through the side. That is a matter of diagnosis. Diagnosis, the recognizing of disease by symptoms. When a person comes in, we look for the cavities and make explorations. We recognize the cavities, but do we recognize the cause of many of the cavities? Do we examine mucous membrane of the mouth to find its condition? Do we examine the gingival border? Here is a little point: The first thing when a patient comes into the office and I am ready to make the examination, I take this good old third eye, the index finger. I have heard some of the famous surgeons say, "Let me see with that third eye." Run it over the apices of the teeth, and you may find the patient will flinch, and you will find these abscesses. That digital examination of the abscess is of great importance. I would urge upon you to begin to do more X-ray work. Find out what is on the inside of some of these teeth.

I had a case of a man suffering from articular rheumatism. He went to an orthopedic surgeon and he said, "I can't find any infection; it must be in your mouth." I made an examination, and as I passed my finger over the tooth, I found a little soreness. The X-ray showed an alveolar abscess. I couldn't get the bridge off, and I went under the bridge and cut out the entire root. A delightful sequence followed. That man is in better health than for years, and is suffering much less with the rheumatism.

A man had a most acute case of neuralgia. It was caused by the roots of the third molar lying in the dental canal. This case required much skill and care, and I do not believe it could be properly handled except under a general anesthetic. I never attempt to take out an impacted third molar without making an X-ray.

A case presented itself where a patient had been suffering from intense neuralgia for two years. There was no sign of a third molar. The dentist went into the pulp of the tooth because it ached, and attempted to fill the root canals. The crown of the third molar had burrowed its way into the canal of the second molar. This gave temporary relief, but in a short time the neuralgia returned with greater severity. The patient was exceedingly anxious to save the second molar, and I thought the third molar could be taken out and that we might preserve the second molar. The patient was etherized. Before he was etherized, all we did was to cut off this coronal portion of the second molar. We then went in and took the third molar out. Where did he get the neuralgia from? Why, there was a large cavity in the third molar under the gum tissue, with the pulp exposed.

An engineer in his cab was struck by a telegraph pole that was bent over. The mandible was fractured, and that was repaired, but after that his lip became very tender, and we endeavored to find out what it was. It was an unseen tooth turned upside down and burrowed into his lip. We took it out and he was all right.

In another case a patient had been suffering with neuralgia for some time. He was wearing artificial teeth. A skiagraph was made, and it showed the broken end of the root of the second molar.

A boy was riding on the back of a wagon; the ground was frozen and he was thrown out, and from the left central around to the bicuspid the teeth were driven out. The case was treated by a general surgeon, but did not heal. I made a skiagraph and found a tooth driven into the alveolar process and into the antrum. I thought it was a bicuspid. The patient was etherized and we went into it carefully, and every time I touched the tooth it jumped into the antrum. We eventually worked it out, and, strange to say, in the place where the second bicuspid should be, we found a central incisor. It was removed and there was an uneventful recovery.

A patient came in who was about to be operated on for cancer of the mouth. We found in the roof of the mouth a large fistula and around it was some necrotic tissue. We made an investigation, and found a cuspid clear down under the gum. We removed the cuspid, and she got well.

In conclusion let me say this, that if the work I have shown you has been of use, and if anything I have imparted of the knowledge I possess has been of benefit, I will feel that my trip to Kentucky has fully repaid me in every possible way.

I. THE SECTION ON STOMATOLOGY: ITS NEEDS, ITS DUTIES AND ITS OPPORTUNITIES.
II. THE FIELD OF STOMATOLOGY*

BY WILLIAM C. FISHER, D.D.S., NEW YORK

ITS NEEDS

I DO NOT THINK there has ever been at any time in the life of this Section any question as to the quality of the membership or of the caliber of their intellect, but I do know that the numerical strength of our membership and more particularly the attendance on our scientific meetings has more than once been a subject of regret and even concern. Time and time again have excellent programs been prepared and presented to an audience so small as almost to discourage the essayist and embarrass the members. Therefore, I venture to state that one of the great needs of our Section is increased attendance and that can be the better accomplished through increased membership. Understand, I do not for one moment think we should lower the high standard that has been so diligently maintained by those who have in the past years guided the affairs of this Section. And it is not necessary to lower our standard one particle. There *must be* hundreds of able men of the dental profession who if an invitation were extended to them would be pleased to affiliate with this Section of the Association and in so doing bring profit both to themselves and their Section.

The great amount of scientific information developed and presented in this Section every year is of great value to the general practitioner of dentistry, as well as the specialist in the several branches of oral surgery; therefore I contend that this Section on Stomatology is not performing its duties until it makes possible such a dissemination of scientific medical dental knowledge. According to the constitution of the American Medical Association, the degree of M.D. is not necessary for associate membership in sevéral of its Sections, and of this number the Section on Stomatology is one. And in its particular case the associate member need only possess the D.D.S. degree. Now this is not generally known. The idea most commonly entertained throughout the dental profession is that the additional degree of M.D. is necessary to qualify for membership in the Section on Stomatology. And also I have heard it stated time and again that the average dental practitioner could not grasp the papers presented here. This may or may not be true, but if true, does it not just as aptly apply to any and all of the sections of the A.M.A. and their respective membership?

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*Chairman's address read before the Section on Stomatology at the Sixty-fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

We must be a little more liberal and admit to our Section good men of the dental profession. Yes, even urge them to join us, if we wish others to receive the benefit of these excellent programs.

THE FIELD OF STOMATOLOGY

What is it? In other words, where does the practice of dentistry, or stomatology, if you wish, end, and where does the practice of medicine begin? To what point may one possessing only the D.D.S. degree go in the treatment of oral infections; and, if my question will not appear too foolish, to what point may a person possessing the M.D. degree go while in the same field? Some of you at this moment are wondering why I raise such a question and what can be gained by it. I raise the question for this reason: that there are at present many men possessing both the M.D. and D.D.S. degrees but licensed by their state to practice only dentistry. They are, I feel sure, frequently in their daily routine trespassing on the territory of the medical practitioner.

Now, legally, these gentlemen are no better off than the man possessing only his D.D.S. degree and so licensed. But I am sure many of the former class have not quite realized this and in their enthusiasm to care for their patients have lost sight of the fact that there must be some point at which the practice of dentistry stops and the practice of medicine begins.

Where that most aggravating point may be, your chairman is not going to dare even to suggest. But it does exist. And the presence in the dental profession of men with great scientific and medical knowledge, which they are daily applying more and more to the practice of dentistry, becomes almost a serious question as to just how far this dental practitioner may go and yet obtain the protection of the law for his acts. Sooner or later the several state legislatures will find it necessary to locate and define this dividing line and it is for this reason that I at this time raise this question, that you may give it serious thought, so that, when the time comes neither the dental nor the medical practitioner shall be hindered in his work, or what is more important the public shall not be deprived of the skill of even one man.

Do not understand me to say that scientifically there is any dividing line between the practices of the two professions. It cannot possibly be located, for it does not exist, but legally it does and we must define it, or better, define and remove it.

373 Fifth Ave.

ABSTRACT OF DISCUSSION

Dr. John S. Marshall, Berkeley, Cal.: I have always been intensely interested in this section, and when Doctor Talbot and I and some of the older men joined it we had to have the medical degree; no one was eligible else. The object in organizing the section was, as Doctor Fisher has indicated, to disseminate dental knowledge to the general medical practitioner. That has been the object all through the history of this section. I believe this section has been the leader in many things with regard to dental medicine and dental surgery. Of course, at first, we realized that, inasmuch as the medical degree was a prerequisite for membership, we could never be a large body. Some may remember that when the association met in Chicago in 1886, Doctor Allport introduced a motion making dental surgeons with the D.D.S. degree eligible to membership, provided they came from colleges which had the same preliminary requirements that the medical schools had, and that did the same work in the fundamentals, chemistry, physiology, anatomy, etc. That was passed unanimously. Later, after I went into the United States army, some change was made in the constitution whereby we have regular members who have the D.D.S. degree and also associate members. That has not added materially to the size of our section. There seems to be something lacking to build up the section; what that is I am not prepared to say. I want to make this suggestion, however, that we take up original investigation and present it to the association as presented today by Doctor Price as part of the work done by the research commission of the National Association. Our work has always been in the preparation of papers on those subjects that we consider vital for the medical man to know, and these have been read with a great deal of avidity, and altogether we have done much toward bringing before the medical profession the real benefit of a thorough knowledge of dental diseases and their application to general medicine. I should be glad if this old idea of separation between medicine and dentistry could be obliterated. There is a coterie of men always talking about the dental profession as separate and distinct from medicine. I have always talked about dentistry as a department, a specialty of medicine, as much so as that of the eye, ear, nose or throat, or obstetrics and gynecology; but there is a feeling, and statements have been made by older men than myself in the profession, that they did not want to be the tail to the dog. I think it is a good thing to be the tail sometimes, provided you can wag the dog. I believe the time is coming when the distinction between dentistry and medicine will be wiped out and we will be simply called dental specialists instead of a separate profession of dentistry.

Dr. H. L. Wheeler, New York: I am desirous of getting some information. I find written across my membership card always, and I have been a member of this section for many years, "Associate Fellow." Can anyone tell me what that means?

Dr. E. S. Talbot, Chicago: I cannot answer that.

Dr. F. B. Moorehead, Chicago: If you became a member through your state medical society, you should be a Fellow.

Dr. Wheeler: I am a D.D.S.

Dr. Moorehead: Then you are simply an "Associate Fellow."

Dr. Wheeler: That is the rub. I have no inclination to apologize for being a D.D.S. I have the medical certificate from the regents of the state of New York, but a great many dentists feel that there is a distinct line drawn between the degrees of M.D. and D.D.S., to the disadvantage of the D.D.S., in an organization composed largely of men with the M.D. degree. I feel it because I have probably done more organizing of dental service in hospitals than any other man in the country, and I have had that same difficulty in New York, which has dealt absolutely fairly with the dentist from start to finish, and there, at present, dentists are on the same footing as medical men, getting the same titles and the same pay in every department in which they serve. I believe this section has been useful and I believe that it can be made more useful. I believe, as Doctor Marshall has said, that our profession is a specialty of medicine. I have no sympathy with the idea of dentistry's being a separate profession any more than I feel that it is necessary for me to apologize for being a D.D.S. and nothing else. I believe that the D.D.S. covers that specialty thoroughly and completely, and that if dentists are wanted to attend these meetings they must be given to understand that there is no discrimination between men; that if one has the ability it does not matter what degree he holds. When the profession is convinced that whether the M.D. degree is or is not held, if a man holds the D.D.S. degree and shows ability to work substantially for the good of the healing art, I think we will have a much larger membership than we now have. I do not mean to infer that the attitude of the section is against the man who holds only the D.D.S. degree, but there is a great misunderstanding with regard to it which needs to be rectified. For instance, members of this section in New York have attempted to establish special service in the hospital in New York, and have insisted that if dentists were to have the recognized position they must have the M.D. degree. You cannot successfully establish such service if that policy is followed out. I have told them, and it is a fact, that in no institution in which the M.D. degree was insisted on have they got any further than the extraction of teeth. The institutions in which they have taken care of the mouth and teeth, in which they are working with the physicians, visiting the wards, and looking after the mouths while the physician is looking after the rest of the body, are the institutions that have taken the dentist without regard to degrees. I am grieved that there should be any difference of degrees when it comes to dentistry, and I believe the quicker that can be ignored the more quickly will institutions of this kind increase their strength.

Dr. E. S. Talbot, Chicago: I shall have to correct both Doctor Marshall and Doctor Wheeler with regard to the matter. There is no difference in their standing, except in degree. As Doctor Marshall has said, when the resolution referred to was passed, dentists were put on an equal footing and we have never had a single instance in which there has been any discrimination from that time. I have repeatedly explained this condition to various men, and if dentists do not understand it, it is their fault. There has not been a single instance come up in the section in the house of delegates or in the general body where the dentist has been discriminated against in any way.

Dr. Marshall: Is that so today?

Dr. Talbot: Certainly it is so today. Every dentist in this section has the same privileges as the medical men.

Dr. M. I. Schamberg, New York: After listening to Doctor Talbot's explanation that there is no discrimination between dental and medical members of the association, I call attention to the fact that my card likewise records me as an associate member, and at times it has been worded "dental member," although I hold both the medical and dental degrees. When I came into the section I was a member of the Philadelphia County Medical Society, and I was not even aware that my name came from any other source than through the county medical society, so that I have been surprised to be recorded as a dental member of the American Medical Association. That, however, is a trifle, because, as Doctor Talbot has said, there has been no discrimination at any time by the medical members toward the dental members of this association. Several points mentioned by Doctor Fisher are of vital importance not alone to the members of this section but to many men practicing throughout the country whose status is not definitely defined by the law, or is not definitely understood. At present I am practicing in the state of New York under a dental license, having been unwilling to submit myself to the humiliation of passing the medical examining board ten or fifteen years after I had finished with the elementary subjects. This, however, every physician has to contend with when moving from one state to another, and makes it imperative that the legislatures of the various states should consider that dentists are primarily medically educated; that we take the elementary medical subjects whether or not we hold the medical degree, and that it is merely coincidental that dentistry has developed as it has in the separate schools. Many men with the D.D.S. degree are as able to perform operations in and about the mouth as we who were fortunate enough to have extended our work a year or so and acquired the M.D. degree. Dentistry is in truth a specialty of medicine and there should be no distinction between the two professions. I believe that, in time, the specialties of ophthalmology, otology, gynecology, etc., will be acquired as dentistry is. This is distinctly a day of specialties, and I believe that men in other specialties are less fitted for special practice on the day of graduation than are the members of the dental profession. It requires special instruction, and dentists have been receiving this and also instruction in the fundamental principles of medicine. Doctor Fisher's address should not be casually passed over. I believe dentistry should be defined in the statutes of the various states.

Dr. G. V. I. Brown, Milwaukee, Wis.: I have given the better part of the last few months to consideration of this subject. It is a pretty good time now for us to clear the atmosphere of these doubts so far as may be possible, and when we get into it a little more deeply there are some very distinct underlying educational questions which must in some way be satisfactorily answered before we can entirely dispose of the matter. I have been trying to suggest a way by which we may ultimately find out where we stand.

With regard to Doctor Wheeler's question, here is the difficulty with regard to membership; when the dental colleges agreed on a four-years' course, the dental members were on a par with the medical men and no difference was made, but when they went back to the three-years' course, there must necessarily be some distinguishing mark between the man who has three years and the man who has four.

Dr. Wheeler: The dental colleges are coming back to the four years' course.

Dr. Brown: I think they are coming to that, but until then there must be some distinction. It does not make any difference either in the conduct of the sections of the association or their members, but nominally there must be a difference.

Dr. R. H. Ivy, Philadelphia: There is a way in which the section might bring the dental profession closer to the medical profession. The papers of different medical journals are abstracted each week in *The Journal* of the American Medical Association, and it might be possible through this section to have some of the papers appearing in the dental journals abstracted, as many of these papers are of interest to the medical profession. In that way much of the work of the dental men with regard to oral sepsis and other things would be directly brought to the notice of the medical profession.

Dr. William C. Fisher, New York: I did not purposely bring out the difference in the standing of the members. My idea was to bring to your attention facts which I thought possibly many had forgotten. Doctor Marshall seemed to think that the object of this section was to educate the members of the medical profession in things dental. I think if that was the object of it in its organization, we certainly should widen the scope and also educate dental men in things medical.

A PRACTICAL SUGGESTION*

BY CHARLES LANE, D.D.S., DETROIT MICHIGAN

Instead of placing a Gilmore upper piece in the mouth with a broad reinforced bar from ridge to ridge, place, by bending with pliers, 14-gauge half-round wires which have not been annealed, but retain the original spring; force one at the anterior of the piece, not so far forward that it interferes with speech articulation, the other at the posterior. Thus the bulk is not so great and is still sufficiently strong to withstand handling out of the mouth.

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*Clinic at Michigan State Dental Society, 1914.

THE SECTION ON STOMATOLOGY AS A FACTOR IN THE EVOLUTION OF DENTAL AND MEDICAL SCIENCE*

BY GEORGE V. I. BROWN, M.D., MILWAUKEE, WIS.
ORAL SURGEON, CHILDREN'S FREE HOSPITAL AND ST. MARY'S HOSPITAL

RECENT ADVANCEMENT toward more general recognition of the pathologic influence of oral affections as factors in disease has been so great that almost every thought of distinction between those who treat disorders of the teeth, and the practitioners whose ministrations are directed to the relief of such distress in other anatomic regions, or of the organism as a whole, has been swept as driftwood before a tidal wave in the common desire of a great humanitarian impulse that brooks no trammel of limitation by degrees or titles.

Surely this is an age when dreams come true, for the visions that inspired the speech and directed the pens of such men as Alkinson, of New York; Garretson, Bonwill and Flagg, of Philadelphia; Allport, of Chicago, and their contemporaries in early years touching as they then did the very boundary limits of the heights of empiricism, are now becoming prophetic in the light of actual scientific demonstrations of their truth.

In like manner the foundation laid with the help and guidance of the master surgeon, Samuel D. Gross, and the great builder of medical associations, Dr. N. S. Davis, and the little band of dentists who joined hands as organizers of the Section on Dentistry, now the Section on Stomatology of this great body, the American Medical Association, has become the underlying support of a rapidly extending scientific edifice. It is obvious that this superstructure can be sustained only by an ever-increasing broadness at its base; otherwise this influence must perish. It therefore seems advisable at this time to glance backward along the recorded pages of the thirty-two years of the Section's existence and then to scan as best we can the already forming, though ill-defined, outlines of the possible future requirements in this division of medical science.

At a meeting of the American Medical Association held at Richmond, Va., May 3, 4, 5 and 6, 1881, there gathered together for the purpose of forming a Section on Dental and Oral Surgery the following organizers: Drs. W. W. Allport, Chicago; Huxhurst, Grand Rapids, Mich.; Eugene S. Talbot, Chicago; T. W. Brophy, Chicago; J. A. Williams, Boston; George L. Parmlee, Hartford, Conn., and D. H. Goodwille, New York. At that meeting Dr. Samuel D. Gross, of Philadelphia, asked for a suspension of the regular order of business and moved that the by-laws of the association be so amended as to create another Section to be known as No. 7, and entitled "Dentistry." This was made effective the following year.

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*Read before the Section on Stomatology at the Sixty-fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

The first meeting was held at St. Paul, June 6, 1882. It is especially interesting in view of later events to note that at this time Doctor Allport offered a resolution providing for the appointment of dentists in the army and navy and to co-operate with Doctor Maynard, of Washington, for this purpose.

The resolutions of sympathy spread on the records of the Section, as they from time to time mark the passing of some important member, bear the stamp of a depth of feeling that cannot be measured by ordinary standards because each one of these far-seeing men was an integral part of the little group that was laboring for higher things in the progress of dental science.

My purpose in presenting this brief reference to the past is not so much an endeavor to do justice to faithful individual effort during a period of thirty-two years, deserving of such praise as the work may be, as to try to present in just the right way, if possible, the whole scheme of the present status of the pathology and treatment of tooth and mouth affections in their common relation to other diseases and incidentally to assist in clearing up the confusing conditions which pertain to the professional association of those who treat them, whether distinguished by the degree of D.D.S. or M.D., or both.

I fully realize that it will be next to impossible for me to state in exact terms just what this relationship, or state of interdependence, should be, for no one really knows and no two of those who ought to be best informed have ever been able to state their views similarly. Yet for this very reason there is even greater need of proper treatment of this subject.

To picture comprehensively the real influence of the work of this Section, one should have in mind, first, the all-important part that the mouth plays in the etiology of disease, as a source of focal infection, a cause of local or general nerve disturbances, and a factor in developmental, digestive, circulatory and other disorders; second, a just idea of the constructive benefit of the steadily continuous presentation of these subjects during thirty-two years in a section of the largest and best-recognized medical organization in this country, and of calling the attention of medical practitioners to this particular field in a specific way through the medium of their own medical journal; third, it should be understood that in the past too much attention has been given to degrees and much harm done through failure of dentists generally to realize that strictly dental organizations bear precisely the same relation to the Section on Stomatology of the American Medical Association that the special societies of other divisions of practice bear to their respective associations.

For example, the sections on surgery, internal medicine, eye, ear, nose and throat have their corresponding associations in the American Surgical Association, American Neurological Association, American Laryngological, Rhinological and Otological Society, American Dermatological Association, American Association of Obstetricians and Gynecologists, etc., just as the dentists have the National Dental Association. There should be no question of loyalty involved in consideration of attendance on both.

When the members of the National Association of Dental College Faculties voted to extend the courses in their colleges to four years, the American Medical Association promptly accepted dentists to full membership in this body; but when the colleges decided to go back to three-year courses for graduation, it was obvious that there must be some distinction between men who have had four years' training when considering their association with those who have had only three. Thus dental graduates came to be accepted as associate members, but there is no appreciable difference between these two forms of membership in the conduct of section work, and there ought to be a more general understanding of the fact that every dentist in this country has profited in some degree, at least, professionally, socially and even personally, by the good work that this Section has accomplished.

There are grave questions to be met if dentistry is to hold her own in the advancement which marks the modern appreciation of pathologic and therapeutic considerations. This is no time to cavil about degrees. The true standard in rating the future practitioner in that branch of the healing art which directly relates to oral affections must be the measure of his knowledge of medical science, and his ability to cope with the requirements of a more or less radically changed order of practice.

From an educational point of view this means that the formerly so-called theoretical branches of the curriculum of his special college courses are after all in reality the very practical ones. Students of dentistry can no longer be permitted to skim through these studies and pass out into active practice with only a superficial knowledge of them. Anatomy, physiology, physics, chemistry, biology, histology and pathology are quite as necessary for them as for their brother students in general medicine. Obviously this cannot be accomplished under the plan of instruction as now given in preparation for the D.D.S. degree.

If, as Rosenow and other investigators have apparently proved, the principal sources of focal infection are found in the tonsils, the mouth, teeth, nose and nasal accessory sinuses, and if, as he also states, pathogenic micro-organisms can be harbored in these situations during the period of transmutation by which they may assume an increased virulence which makes them accountable for such diseases as ulcer of the stomach, rheumatism and its well-known chain of far-reaching symptoms, for endocarditis, myocarditis, gall stones and joint affections, and if in addition it can be shown, as we believe it can, that by proper care of the teeth and direction of the development of the dental arches, the pathologic conditions of both the tonsils and the nasal accessory sinuses can in large measure be controlled or prevented, then it must be accepted that full medical training is as essential for the one who has charge of the welfare of this fertile field for the propagation of disease, as it is for those who undertake to treat the general bodily manifestations thereof.

This does not of necessity mean that a student must first pursue the regular four years' course in medicine with the additional premedical and postgraduate years of studentship that are now being urged as necessary for proper training for the practice of medicine, and in addition a full course of two or three years more to complete his equipment for the practice of dentistry.

Desirable as these long years of preparation may be, and admitting to the fullest extent the value of the knowledge that might thus be acquired, there are nevertheless certain definite reasons why such preparation for the practice of dentistry is not practicable under present educational conditions.

Lest my position be misunderstood in view of this statement, and others that follow, it seems advisable for me to state that according to my belief it will no more be possible for dentistry to continue permanently as a profession distinctly apart from medicine than it was for the United States to exist half slave and half free, as recognized by Lincoln.

There must ever be some common meeting ground for all who practice legitimately every branch of the healing art. That has been, and will be with steadily growing recognition of its importance, the office of this, the representative stomatologic division of this great medical body.

Beyond a doubt there must come in the course of time the adoption and general use of degrees to distinguish the several medical divisions. Men without special training in surgery cannot be permitted to continue indefinitely to undertake grave surgical operations simply because they have qualified to the extent of a medical degree and a state board examination of general character. This is equally true of eye and ear, or nose and throat, or other limited practitioners, and they also should be required to have distinct evidence of preparation for their particular field of work.

With the continued extension of the required number of years of medical study and the very evident need of additional training for special practice, it would seem that in the course of the evolution of educational conditions there would ultimately be established a fundamental course of study which all must complete before taking up a special division of practice. The number of years required for this foundational preparation would be somewhat less instead of more than is now required for the M.D. degree, and the student after having completed this course could then in two years more of special study prepare himself for the degree which would represent his actual life work more completely than is usual at the present time. The following opinion expressed by Dr. E. C. Kirk is of interest because he is in charge of the Thomas W. Evans Museum and Dental Institute, and therefore in control of the largest structure in the world exclusively devoted to dental instruction. As this institute is designed to give both undergraduate and postgraduate instruction, the views of one who is to direct its course are important in this relation:

> It seems to me to be inevitable that in the course of time a rearrangement of the medical curriculum must result from the specializing tendency, and from the increase of bulk in medical knowledge, both of which factors have made it impossible to educate any man in medicine so that he can cover the whole ground.
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> That reorganization will, I think, take something of the following form: A sufficient length of time in the medical curriculum will be devoted to the training of men in all of the sciences that are fundamental to the entire field of the science and art of healing, and the termination of that phase of the curriculum will be marked by the conferring of a degree which will be educationally equivalent to the bachelor's degree in science and letters, and from the point of attainment of the bachelor's degree in medicine, the student will specialize in groups of studies that will make him an efficient practitioner in some recognized special department of medicine at the termination of which he will have conferred on him his doctorate in medicine, and he will be licensed to practice only within the limits of the specialty for which he has been trained. Should he desire to acquire the right to practice an additional specialty it will be necessary for him to prepare himself by further educational work in another special department, and then secure the license to permit him to practice in that department, and so on.

It may be too much to demand such sweeping reforms in medical education until such time as in the course of natural evolutional progress these changes gradually may be inaugurated. There is, however, an immediate necessity for more thorough education of students who are to become dental practitioners in the branches of study in which their courses parallel those of their brothers in medicine. Without delay these fundamental medical sciences should be given exactly the same as for students of general medicine, and a passing mark on any one of them should be considered equivalent in every way, no matter what branch of practice may be contemplated or selected. Thus, the dental graduate will not only be more thoroughly prepared for his special division of practice, but he will also have so many definite credits toward the medical degree that he may reasonably be able to complete this course also without too much hardship. In due time it will follow that increasing numbers of the most promising students will complete their double education and take both degrees. Ultimately through the selective influence of a more enlightened laity the two degrees will be required.

Dealing practically with the educational difficulties that lie in the way of idealization in this educational formula, we find that in the absence of certain necessary but apparently impossible changes in the underlying primary courses of instruction, by the time the average student could complete his literary course with four years leading to a degree in arts, or science, and then four years in medicine, with the very necessary hospital internship of one year more, in a majority of cases he will have reached such an age that the first enthusiasm of his career will be lost. It is a grave question if the average result would be as good as it has been in the past when an aspirant for a medical degree was allowed to enter the medical college with but little if any more preparation than a high school education. But leaving that much-discussed question for the settlement of educators now battling with it, there at least can be no question regarding the probability that at this advanced period of life it would as a general rule be quite impossible for an individual to acquire the necessary manual dexterity for successful dental practice. It would seem then that the best that can be done at the present time is to so arrange the curriculum of the dental student as to make it possible for him to have full training in the technic laboratories from the very beginning of his course, and to take during his first two years as many of the strictly medical studies as he can carry and complete in each the full regular medical student's course in these branches.

Obviously when the medical student's first and second years are crowded to the limit of average capacity, the dentist cannot do all this thoroughly and spend approximately forty hours a week in dental technic laboratories besides. Every teacher of anatomy or physiology or other similar branch can testify to the difficulties that have presented themselves when this has been attempted. By distributing the work and making the courses for the dental degree extend through four years instead of three, then with all this work out of the way, one year more could be made sufficient for acquirement of the medical degree.

Our problem is thus a problem no longer and the dentist is now a completely developed specialist in his work. Whatever the final solution of the complex professional relationship may be, it is at least apparent that the influence of this section, past, present and future, will be instrumental in its final adjustment.

The horizon from a dental and oral outlook appears wonderfully bright at the present time. The establishment of free dental clinics in many of the principal cities of the United States, examinations of the mouths of school children, lectures on oral hygiene under state appointment, endowed institutions for the care of the mouths and teeth of the poor, and the systematic education and training of dental original research workers, supported by funds contributed for the purpose, are some of the many evidences that might be cited of the undisputed right of this stone rejected by the medical builders in 1840 to place in the great temple of medical science.

Who can doubt that the cumulative effect of the long years of faithful educational service that the members of this Section have rendered has been a potent influence in the preparation of the soil in which the seeds of the various movements have given such gratifying evidence of fertility? Above and beyond all other factors, the usefulness of the work of this Section must be attributed to our secretary, Dr. Eugene S. Talbot, who has made it his life work, and who for years has directed the broadness of the scientific policy that has shaped the character of the program from year to year.

Next to this the most active influence has been the earnest co-operation and assistance of Doctor Simmons and his predecessor, Doctor Hamilton, as editors of *The Journal* of the American Medical Association, without which there could have been no such wide spreading of the truths of the gospel of oral medicine.

For the future the most desirable consideration appears to be a closer union between this Section and the state, county and national dental organizations such as may lead to increased co-operative activity. This would also lead to a more widely extended recognition of the value of this link in the chain of medical specialties which has been so carefully welded and forged and tried in the fire of these many years, in order that it might be relied on to hold with sufficient security its own representative division in proper relation to all other parts of the associated body of the sacred order of those whose mission is to mitigate and relieve the ills of suffering humanity, whose common purpose is to render human life happier if not longer and at least a little more worth the living.

445 Milwaukee Street.

ABSTRACT OF DISCUSSION

Dr. Joseph Head, Philadelphia: Doctor Brown's paper states clearly a fundamental thought that has been in the mind of every intelligent dentist since he began to practice. The dentist ought to be so perfect a mechanic that such perfection would be considered a goal easily sufficient for a life occupation; but the dentist also should be a thoroughly trained physician. We find that the mechanical appliances of dentistry which heretofore have been considered independent of a knowledge of medicine are now so closely associated with the health and happiness of the community that they can no longer be considered apart from pathology and therapeutics, but all these must be considered as an independent whole. For just as general medicine contains specialties, a complete comprehension of which would require twenty-five or thirty years to master, so the dentist has undertaken a specialty the complete comprehension of which would require ten or twelve years. This preliminary training is not feasible. By the time a man has studied ten or twelve years in college he will be so old that the enthusiasm of youth will be apt to be lacking and so it would be difficult for him to build up a practice. There should be, in my opinion, a bachelor's degree of medicine that *per se* would not allow any man to practice medicine, but from which he could go on to the special doctor's degree to which he would effectively confine his efforts.

Dr. F. B. Moorehead, Chicago: The discussion of any educational subject is of vital human interest and no set of men can ever determine the ultimate policy of any educational system, simply because it is a matter of evolution. This whole question that we are facing today in the matter of dental and medical education is simply a sign of the times. As man expands in thought and usefulness in the world, he is most surely going to demand a different type of training, and that is what this means. The question of dental education is a live subject today, because we are now facing a fact and not a theory. The physician and dentist have both awakened to the fact that the mouth is more important than it was thought in the past, and, therefore, the dentist must face and solve some serious problems. This calls for a different type of dental student. How to make that different type is an exceedingly difficult problem. We must educate enough dentists to care for the people and at the same time we must change from the kind of education we have given in the past and make the dental student a broader man. One step in that direction is the four-year course which I am convinced is sure to come. The first year in the four-year course should be a predental year in the university. The university method of study; the university enthusiasm and spirit will give the student a bigger and better perspective. This is the type we must have for the dentist of tomorrow. One cannot get away from the fact that, as much as we value medical training, the man who is to be a good dentist must be a good mechanic, because if he is not he cannot make his patients comfortable, and unless he makes his patients comfortable he is not serving them properly. The man who is uncomfortable is physically and mentally unfit. So we cannot lose sight of the fact that we must make mechanical dentists while developing the man of parts to take care of the medical side of dental practice.

Dr. Arthur D. Black, Chicago: I think Doctor Brown has presented the consensus of opinion of a great many physicians and dentists as to the general proposition of the future of our educational system in medicine and dentistry, and the relationship which will probably exist between dentistry and the other specialties on the one hand, and a general medical education on the other. By the process of evolution we are gradually coming to the point where, whether it is taught in the medical school or in the dental school, all men who practice medicine and the specialties of medicine must have the same foundation education. It is certainly as important that the dentist know as much of general medicine as the man who is practicing any other specialty of medicine. That it will be a great many years before the dental specialist gets that foundation in the medical school, I am quite thoroughly satisfied. The greatest problem that we have from the point of view of dental education is that of developing a different type of men in the dental school; men who will enter with the idea that they will have to study and master physiologic and pathologic problems as a basis for their technical service. In the school with which I am connected we are endeavoring to develop this type under the conditions which now necessarily exist by shifting more of those subjects which require hard study into our freshman year and diminishing the amount of technical work required during that year. We hope to impress the student with the fact that he must learn to study if he ever gets the dental degree, and at the same time we are eliminating in the freshman year a lot of men who will not study. Doubtless the higher entrance requirement, especially if this consists of a prescribed course of a year in college, will be of material aid, both in the extra year's work and the college associations. This is a problem which many men interested in college work are considering at present; that we should prescribe, previous to admission into the dental school, not only a high school education, but definite instruction in certain branches which the academic department is better qualified to give than is the dental school.

There is, however, another question to be considered in this connection. While the dental school must develop men who will be able to solve the more complex problems involved in the relationship of mouth conditions to general health, they cannot, on the other hand, overlook the greatly increasing demand for the ordinary care of the teeth. The wave of public education in oral hygiene has brought such an increased demand for the most ordinary dental service that we cannot go so fast in this matter of advancing dental schools that we will materially reduce the number of graduates and thus not provide sufficient men for the ordinary dental service.

Dr. Eugene S. Talbot, Chicago: At the time this section was established few graduates of medicine were practicing dentistry. Indeed, very few were graduates in dentistry, as compared with those practicing without a degree. The friendly relations between dentistry and medicine, and between graduates of dentistry and non-graduates did not then exist. The medical profession on the other hand has always shown the greatest respect for our specialty. This is no doubt due to the fact that physicians realize that each branch of medicine has gradually advanced from small beginnings, requiring many years to reach the present state of evolution. They are willing and glad to help the youngest branch of medicine in its rise to a higher position. The Section on Stomatology has from year to year endeavored to represent the best material in the dental profession. We had been organized only a few years when we found that some of the ablest men practicing dentistry had not the medical degree, which was then necessary for membership in the A. M. A. We petitioned the general body and they immediately changed the constitution and by-laws so that practitioners of dentistry, holding the degree of D.D.S. and belonging to their state and local dental societies, could become "dental members," enjoying all the privileges of regular medical members. Again the medical profession came to our rescue and gave us a helping hand. Dental members have been stimulated to a higher sense of their relation to medicine. On the other hand, at nearly every meeting the names of physicians and surgeons are on the program. At present physicians are invited to read papers in dental societies and dentists have read papers at medical gatherings. There is no doubt that, in the future, some medical societies will recognize the dental degree for all that it implies, just as they now recognize other specialties in medicine. Recently a mutual ground between dentistry and medicine has been found, for which this section stands and which neither dentistry nor medicine are in themselves qualified to practice or teach. Those who will be the future successful practitioners of stomatology must be well grounded in the general principles of medicine. The practitioner of medicine has already begun to recognize those specialists who are abreast of the times with regard to mouth infection as a source of systemic disease. The physician will soon seek those who are competent to assist him in making an exact diagnosis. Dentists who wish to be successful in the future must thoroughly educate themselves in both medicine and dentistry. The Council on Medical Education should discourage medical schools from conferring medical degrees on dentists who have not taken the prescribed medical course.

Dr. W. C. Fisher, New York: Doctor Brown's suggestion as to the establishment of the B.M. degree is a good one. I read a paper last year entitled, "The Need of a New Degree, Bachelor of Medicine." I simply gave it as a suggestion at that time, and backed up my statements by those of Doctor Bevan, of the Council on Medical Education of this association, in which he stated that too much time was being wasted in preliminary preparation before men entered the medical schools; that we could not turn out competent medical men in twenty-nine or thirty years with the present restrictions, and that some new scheme would have to be devised whereby men could go out on their life work earlier. Professor Lowell, of Harvard, has said that instead of demanding the Bachelor of Arts degree before entrance to medical schools it would be better if we would incorporate some of these studies in the course leading to the Bachelor of Science degree and take one year from the four-year course, instead of spending a couple of years in studies that did not particularly relate to medical education. The man who has an excellent preparatory school education, and that does not mean two years in college, is qualified to undertake the study of the sciences of medicine and dentistry. When we speak of getting better men I am in favor of that, but I am opposed to anything that makes it so late in life before a man can acquire that degree which entitles him to go forth into the world and earn his livelihood.

Dr. G. V. I. Brown, Milwaukee, Wis.: We have been discussing subjects that my paper relates to ever since the meeting opened, and it is clear to me that, in the settlement of this question, the time element alone will not do it, but it is equally clear to me that we should not make any step in this direction until we know best what to do.

RELATION OF THE DENTIST TO THE PHYSICIAN

BY A. C. MUSGRAVE, M.D., D.D.S., OHIO CITY, OHIO

THE INTER-RELATIONSHIP between medicine and dentistry has been a much discussed question by both the medical and dental profession, without any very definite conclusion being arrived at on the subject. That there should be a bond of union between the two professions, no one will deny. That if the family physician and dentist would co-operate more often, it would be beneficial alike to the patient and the professions, no one will dispute. The line of démarcation, where dental surgery ends and general or special surgery begins, is and always will be a question for discussion.

Before discussing the present status of medicine and dentistry, it might be well to give you a short historical reminiscence of the medical and dental professions. Medicine, acknowledged to be the oldest of all professions, had its origin away back in the mystic ages. It first consisted in the use of roots and herbs by the ancients and was commonly associated with sorcery. In the Holy Scriptures we have perhaps the earliest authentic records pertaining to the art of healing. In the Bible we have reference to the practice of medicine by the Egyptians, and in the book of Leviticus, attributed to Moses, the Law Giver, are our first records of public health and hygiene.

Hippocrates, the Father of Medicine, about four hundred years before the Christian era, was really the first author to give an authentic description of the practice of medicine. Let us pause, just one moment, in our review of the past and take a glimpse at a part of the oath that all who were desirous of practicing the art of healing were required to take by Hippocrates * * * "I will follow that system of regimen which, according to my ability and judgment I consider for the benefit of my patients, and abstain from whatever in my deliberations are mischievous. I will give no deadly medicine to anyone if asked, nor suggest any in council. * * * With purity and with holiness I will pass my life and practice my art. Into whatever homes I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief or corruption. * * * * Whatever, in connection with my professional practice or not in connection with it, I see or hear in the life of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such be kept secret." Only part of the oath is given to you, thinking that if we as professional men would on all occasions be as discreet and caretaking as our professional brothers centuries ago were exacted to be, we would raise the professional and moral standard of our chosen vocation, and also help to disseminate the truths of the Great Physician and Healer of mankind.

Another of the early disciples of Aesculapius was Aristotle, whose work on Metaphysics is still extant. After Hippocrates and Aristotle came such noted men as Galen, Harvey, Jenner and others, who, each in his chosen field, helped the onward march of the healing art. Of these I will mention Galen in particular, who was the most eminent physician and medical writer of antiquity and lived in the second century after Christ. In some of Galen's writings, which are extant, especial mention is made of dentistry. Liebig says of Galen: "The system of Galen in regard to the cause of disease and the action of remedies, was regarded during thirteen centuries as impregnable truth, and had acquired the entire infallibility of the articles of a religious creed. Their authority only ceased when chemical science advancing made them no longer tenable." From Galen until Ambroise Pare, the great "barber-surgeon," and sometimes alluded to as the "father of modern surgery," who, in 1550, published a celebrated work on surgery, but very little was added to dental literature.

You will notice from the above that the practice of medicine for centuries made very little advancement. Yes, indeed, up to the eighteenth century very little advancement was made in anatomy, physiology and materia medica. Therapeutics were limited to emetics, physics and blood-letting. Within the last few decades the science of medicine has made wonderful advancement, due principally to the perfection of chemical analysis, the microscope and the use of electricity.

During the primitive or formative period lasting for centuries, dentistry was so closely allied to medicine that those who practiced the art, as then known, made no distinguishing feature. Diseases of the mouth and teeth were undoubtedly treated by the general practitioner of medicine before the art of dentistry was recognized.

Among the earliest of writers who referred to dentistry was Herodotus, about the year 500 B.C., who states that the practice of medicine in ancient Egypt was divided into specialties, in that there were physicians for the head, others for the internal disorders, and others for the teeth.

In attempting to give the early history of dentistry it is even more uncertain and vague than that of medicine. The early literature contains a description of disorders of the teeth and mouth, and recommend the use of certain roots and herbs for the alleviation of such troubles.

That dentistry was practiced by the Egyptians for centuries before the Christian era is indisputable, and that it was associated with general medicine is also a fact. Within the past few years records and specimens have been found of dental work which was performed by the Egyptians. To what extent the Egyptians practiced dentistry we have no definite information. Yet in recent years specimens of the dental art of that period have been found and are on exhibition in various museums. The Ebers papyrus, the oldest medical manuscript extant, now in the library of the University of Leipsic, dating as far back as 1700 years before Christ, treats of the diseases of the teeth and gums and gives no less than fourteen prescriptions for the treatment of dental diseases.

From the earliest period that we have any record of, medicine and dentistry have been sister professions. There has been a mutual interdependence during their whole development until at the present time this close inter-relationship should make them inseparable.

There was a period of some years in which some phases of the dental art was practiced by the jeweler and goldsmith, especially the filling of teeth and the use of some mechanical appliances, and extracting was practiced largely by the blacksmith and the barber. The last named tradesmen were sometimes called the "barber-dentist" and the "barber- surgeon."

We will mention only one more of these pioneers of dental surgery, sometimes called the "father of modern dentistry"—Pierre Fauchard. He lived during the latter part of the seventeenth century. He was educated and trained for the medical profession but chose to practice the art of dentistry. He was a man of intellectual attainments and wrote a book called "The Surgeon Dentist."

We now approach another epoch in the field of dentistry; that is, in the year 1839, in which the first dental college in the United States was organized and chartered. It was known as the Baltimore College of Dental Surgery. This college seems to have antedated the first college of dental surgery in England, specially organized to teach dentistry, by nineteen years. The first college in the United States was organized by Dr. Chapin A. Harris and some of his colleagues. He first made overtures to the medical department of the University of Maryland, for the establishment ot a special department for the teaching of dentistry, but his proposition was refused. Those who made the refusal claimed that "the subject of dentistry was of too little consequence to justify such action." How badly mistaken they were and what effect if would have had on dentistry if they had remained as one profession would be hard to say. The establishing of the independent dental college is sometimes alluded to as the divorcing of the dental profession from the medical profession. Let it be called whatever you want to, it is an undeniable fact that from this period dentistry began to make greater progress than it had made for years. Up to this time dentistry was almost exclusively mechanical, and that was very crude compared with the dentistry of today. Now it made advancement and progress that was very rapid, until at the present time we have enrolled in the dental ranks some of the best chemists, histologists, bacteriologists and men of letters of the day. One thing the dental schools exacted from its students from the beginning was personal, practical work in clinic and laboratory, while medical schools until recently confined their teaching principally to didactic lectures. A great deal has been said as to whether a dentist should have the M.D. degree as well as the D.D.S. degree. Individually I believe if a person has the time and the money, he will be a better qualified dentist if he could have both degrees. Too much stress, in times past, was laid upon the mechanical side of dentistry, but now more time is devoted to the pathological conditions. That there is a relationship existing between many diseased conditions of the mouth and systemic disorders is brought more to light each year in pathological investigations.

That there should be a co-operation of the medical and dental profession in the treatment of a large number of pathological conditions is realized more at the present time than ever before. The medical profession has begun to realize, within the last few years, that the physician and the dentist should be in closer relation. Some of the leading men of both professions have been urging a closer co-operation both individually and collectively. Only a few years ago the American Medical Association established a section on stomatology, in which all ethical dentists who are graduates of reputable dental colleges are eligible to membership. In some states the medical and dental societies have been working toward the bringing together and the establishing of a closer relationship between the two professions.

Hospitals, which are usually dominated by the medical profession, have begun to realize the worth of dentists, and have appointed them on the medical staff. State Boards of Health have also had them appointed on their boards, and by so doing are getting the benefit of their advice. Uncle Sam has also seen the necessity of having a dentist, and of recent years dentists have been appointed for their respective fields of duty in both the army and navy.

Let us now pause in our review of the past and the present and consider some of those pathological conditions in which the physician and the dentist should be co-workers on many occasions, and by so doing could be of incalculable value to their clientele.

Let us first look at that diseased condition of the teeth called *caries*, and see where the physician and the dentist should be working together. Have you ever heard of a physician attempting to treat a patient for stomach or intestinal trouble with a mouth full of carious and diseased teeth or, perhaps, an edentulous mouth? Just imagine one such case—a mouth studded with carious and broken-down teeth and roots; in other words a veritable cesspool. You have seen them. Are you surprised that a physician meets with failure in such cases? There are many such cases presenting themselves to the general practitioner of medicine. Let him send such cases to the dentist to get their masticating organs in working order and in most cases the troubles cease.

Not only are digestive troubles directly traceable to bad teeth, but some cases of mental and nervous ailments are claimed to be traced to diseased conditions of the oral cavity. Perhaps the physician will lose a source of income when he refers some such cases to the dentist, especially if he is pecuniarily inclined. The dentist, on the other hand, may have patients whose system is below par, and whose teeth are prone to decay;

if so, give such patients a genteel hint to call on their family physician and have the system built up. It may be a case of nervousness; if so, advise them to call on the physician and take a course of treatment and thus pave the way for a more successful amelioration of their troubles.

Erosions, sometimes caused by local wrongs and in many other cases dependent upon systemic pathological dyscrasias, in which the dentist would be wise to enlist the aid of the physician. Let the physician help correct the fault in metabolism and help remove the acids in the saliva, and by so doing assist in the cure of the ailment.

In the treatment of *alveolar abscess* and ulcerations of the mouth the physician and dentist can often be of assistance to each other. I believe that whenever a patient, suffering from an abscessed or ulcerated tooth, calls on a physician, he should advise the patient to call on a dentist at once for the proper treatment. Some physicians have been guilty of trying to treat such diseased conditions by poultices and the lancet and have had very bad results. On the other hand, the dentist may meet with cases of abscess in the oral cavity which will not yield to treatment. Examine your patient and see if there is not some constitutional disease which is the cause of the stubbornness in yielding to the treatment.

In the *extraction of teeth* the dentist should have the field of action. There are some cases, referred to the dentist by the physician, in which it would be wise if the family doctor would go along. In some cases of nervousness and in some cases of pregnancy the physician could be of help to the dentist in the extraction of teeth. Some physicians in the rural district still extract teeth and are justified in doing so. Yet there is one thing that we as dentists should impress on the medical profession, and that is the preservation of the "sixth year molar." Physicians as a class do not realize the importance of this tooth. They often send their little patients to the dentist to have it extracted, thinking that it is what they call a "baby tooth." Some are so ignorant as to attempt to extract it, and after they have failed, send the patient to the dentist to see what the trouble is that a "baby tooth" should pull so hard. Shame on such a physician!

Some cases of *alveolar hemorrhage* come into the hands of the physician. Sometimes a tooth is extracted and after a lapse of some time there is a hemorrhage and the physician is called in. In all such cases he should refer the case back to the dentist, unless it is a very simple case. The dentist will be better equipped to handle such cases.

In *fracture of the mandible* the physician and the dentist should always be coworkers. True, these cases are most frequently met with by the surgeon, and unless it is a very simple fracture, he should at once send for the dentist to help take care of the fractured bone. The dentist, on account of his mechanical skill, will be more competent to make the proper mechanical appliances to maintain the fractured parts in their proper relation until the healing process has taken place.

In the treatment of *abscess of the Antrum of Highmore,* the rhinologist and the dentist should be consultants in many of the cases.

Pyorrhea, the *bete noire* in the practice of dentistry, must not be forgotten as we mention the diseased conditions of the oral cavity that ought to have the careful consideration of both the physician and the dentist. The etiology of this disease is still somewhat in dispute, some claiming it local and some systemic with local manifestations. Yet most of us recognize that we must use local treatment, that is, the maintenance of a strict oral hygiene by the patient and in many cases must be associated with a systemic treatment by the physician, especially if there is a gouty or rheumatic diathesis.

In the treatment of *tumors of the mouth,* the physician and the dentist should be coworkers. The removal of some of these tumors is very easily done, and in some of them "two heads will be better than one." Some such operations are very grave and must be done by those with experience. The dentist often sees these growths in the mouth when they are very small. He should examine them closely and then call the patient's attention to the growth. If the dentist should see a growth in the mouth that he in is doubt of as to its true character, let him refer to an experienced surgeon and pathologist for diagnosis and treatment.

The dentist should always be on the lookout for *syphilitic lesions,* which are often found in the oral cavity. He should post himself, that he will be competent to detect and diagnose such conditions. If he is reasonably positive of his diagnosis, he should advise the patient to consult a physician at once if he has not already done so. Physicians who know of any of their syphilitic patients going to a dentist to have dental work done, should advise the dentist accordingly. Dentists in doing work for a syphilitic patient should exercise every precaution possible against contracting the disease himself or of being the means of transmitting it to any of his patients.

The physician sometimes meets with severe cases of *facial neuralgia* that will not yield to treatment. In many of these cases the dentist should be consulted. Often some dental lesion, such as pulp nodules, an impacted third molar, a carious tooth, an alveolar abscess, pulpitis, etc., may be the cause. In such cases try to discover the cause and remember the adage, "remove the cause and the effect will cease." Often these cases are very stubborn to handle and the physician and the dentist will have to consult a number of times before the cause can be located.

The pregnant woman should have the joint attention of the physician and the dentist. The old saying, "for every child a tooth," is becoming a myth. There are some old women and some so-called physicians who still cling to the saying, but, thanks to the teaching of the progressive physician and dentist, such sayings are passing into oblivion. The up-to-date physicians are beginning to realize the importance of pregnant women calling on a dentist during this period to have their teeth and oral cavity looked after. If some of these diseased conditions are let go they will affect the general health of the pregnant woman, and also the well-being of the future child. When a physician is consulted by a pregnant woman, as most of them are during the first few weeks or months of pregnancy, he should inquire as to the condition of the patient's teeth and oral cavity, and if any wrong should exist he should advise her to call on her dentist for the proper treatment. He should instruct her to apprise her dentist of her physical condition and that her physician requested her to call for the necessary treatment. One writer has said, "the relation and confidence of the patient, physician and dentist should be such that there will be no hesitation on the part of any of them to review the case thoroughly, nor should there be any false modesty on the part of either to cover possible cause of general or dental affections."

The dentist will notice in some of his patients hypertrophied tonsils and others in which the patient is suffering from adenoids. He should, for the well-being of his patient, either call the patient's attention to the pathological condition or, if it be a child, the parents' attention should be called to the condition and advise that they call on a specialist for the proper treatment. Often the dentist will discover these wrongs when the diseased condition was not known to exist.

Another field of work in which the physician and dentist should be coworkers is in cases of cleft-palate, hare-lip and in some cases of defects of speech.

In this day when such advancements are being made in the administration of nitrous oxid and oxygen as an anesthetic, the physician and the dentist could be of invaluable assistance to each other. Up to the present time the dentist is more expert in the use of nitrous oxid and oxygen as an anesthetic than the physician. The physician, if he would only do so, could often have the dentist give the anesthetic, nitrous oxid and oxygen, which would be a boon to the patient. In many minor operations, such as lancing an abscess or felon, setting a fractured bone, etc., the dentist could assist the physician, and the time will come in which nitrous oxid and oxygen will be more generally used in major operations than it is at the present time.

Other pathological conditions might be mentioned in which the physician and the dentist could be of assistance to each other and render valuable service to their patients, but we deem it best not to mention any more.

We will now, in conclusion, take a prospective view of the subject. There are some things that ought to be done away with and others that ought to go on to perfection, and others that ought to be devised and thus bring the two professions closer together and by so doing be the means of being a greater help to ourselves and our clientele.

Let the physician and the dentist work hand in hand in looking after the welfare of their patients; let there be a more-often getting together in association meetings; let the physician be put on the program for a paper at dental meetings and the dentist be asked to return the compliment at medical meetings; let this bond of union be more firmly knit together; let the laity understand that we are one, that is, especially in alleviating their sufferings and in particular in diseases of the mouth and oral cavity and associated parts; let the dental profession refer to the physician those local and systemic disorders that rightly belong to him, and the physician refer to the dentist those diseases or conditions that rightly come under the province of dentistry. Not only let the physician and dentist suggest, but let them insist that their patients go to the respective profession for such treatment. Let them so educate the laity that when they suggest that such a thing be done, that the one to whom the suggestion is made will put the suggestion into execution.

When we attempt to look into the future, let us as professional men try to profit by the mistakes of the past and so acquit ourselves for the task before us that "when our pulses cease to beat and we rest forever from our labors," the world will be better for our having been here.

One of the mistakes that I will mention that I think some of the dental colleges in the past have made and some are still making, is too much commercialism. The main object of some schools is only to see how large the dividends can be made on the investment. This same spirit is the uppermost thought of some dentists and they will resort to anything to accomplish their purpose. Let such schools raise the standard of requirement for entrance, if possible; make the standard the same as that of our best medical colleges. If the dentist wants to be on the same plane of recognition as the physician, he must have the same intellectual qualification. Medical colleges are much in advance of dental colleges in this respect, hence the material that they turn out must be in advance of that of the dental college—that is, the finished product. Too much commercialism in many of our dental colleges is what, to me, lays the foundation of many of the "unethical and quack dental parlors" throughout our land. When the course in dentistry was raised to four years, and only tried out for a short period, why did it go back to the three-year course? Most of you know—commercialism. Again let me say, raise the standard of entrance qualification to the same as that for entrance to the medical college; also, make the course a four-year course and there will not be so many failures of young dentists when they embark in the profession.

This is the day of preventive medicine and prophylactic dentistry. In this field of work the medical and dental professions are closely allied and should work shoulder to shoulder.

For years the medical profession has been calling attention to every organ of the body except the mouth. This day is fast fading away. The progressive physician has begun to recognize the importance of the mouth and the organs located therein. Many physicians who are specialists will not treat certain diseases until the organs of mastication are first placed in working order. There is a joint relationship between the two professions and each should welcome the kindly aid of the other.

It would be folly for me to try to enumerate the good that the two professions can and will accomplish in the future. There is one trait of character of many who are members of the profession, that they should try to eliminate—that is, selfishness and short-sightedness. Cultivate a deep feeling of sympathy and helpfulness for each other and dissipate the submerging spirit of commercialism and competition and envy which now pertain to too marked a degree. Too many physicians and dentists follow the idea of the Levite instead of the plan of the good Samaritan. They well know what ought to be done, but say, "What business of mine is it?" and pass by on the other side.

In conclusion let me use the words:

"We go our ways in life too much alone,
We hold ourselves too far from all our kind;
Too often we are dead to sigh and moan,
Too often to the weak and helpless, blind.
Too often where distress and want abide
We turn and pass to the other side.

"The other side is trodden, smooth and worn
By footsteps passing idly all the day;
Where lie the bruised ones that faint and moan
Is seldom more than an untrodden way;
Our selfish hearts are for our feet the guide,
They lead us by upon the other side.

"It should be ours the oil and wine to pour
Into the bleeding wounds of stricken ones;
To take the smitten and the sick and sore,
And lead them where a stream of blessing runs.
Instead, we look about—the way is wide—
And so we pass by on the other side."

TECHNIC OF INVESTING WAX PATTERNS*

BY DR. R. L. GIRARDOT, DETROIT, MICHIGAN

First brush the pattern over with soap suds; this cuts the grease and allows the investment to run ahead of the brush better. Weigh out your investment in the scales furnished. In the largest size plaster bowl that is absolutely clean, spatulate the investment for one-half minute with a rubber spatula obtained for that purpose; then with a rotary egg beater, mix it up for another half-minute. For another two minutes jar it around in the bowl to eliminate all bubbles of air and gas. Proceed to invest by pushing the investment over the pattern ahead of the brush, which is the smallest that can be obtained. Place the flask on the stand and pour in the rest of the investment, and do not move or jar the flask until the investment has set.

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*Clinic Michigan State Dental Society, 1914.

ANALGESIA*

BY G. W. TAINTER, D.D.S., ST. CHARLES, MO.

ANALGESIA (MEANING INSENSIBLLE TO PAIN) is more definitely defined as the absence of sensibility to pain, though not unconscious. This is the effect experienced during the early induction of a general anesthetic when the periphery or end nerves have lost their function of sensation although consciousness exists.

Many drugs have the physiological property of producing analgesia. Opiates produce a general analgesia, and local anesthetics produce local analgesia.

The dental surgeon has sought long and diligently for an analgesic applicable to operations upon the teeth, and that this is now substantially accomplished marks an epoch of a glorious achievement in the history of our profession.

But the path of ultimate success is strewn with the wrecks of many efforts and today, as never before, the hope of the dental surgeon is realized, and the wails of the laity are appeased. While we grieve that the dental profession has tarried long in discovering a means whereby the torture of the dental chair might be averted, we feel elated to think the discovery and development of surgical anesthesia was the effort of one of our own calling—namely, Dr. Horace Wells, in the year 1844.

This undoubtedly was the greatest blessing ever given to human kind, and the triumph of analgesia for the dental surgeon is none the less important.

While a practical analgesia for dental operations proved the hardest to find, success might have been sooner accomplished had it not been that heed was taken of a warning note from the general surgeon, namely, "That an operation attempted with any but deep narcosis is attended by grave danger." This, no doubt, was the barrier that actually prevented success, or rather delayed it. There is no anesthetic so easy to administer or so easy of control as one to be inhaled, and with this desirable quality to produce analgesia for dental operations, the peer of all anesthetics is nitrous oxide combined with oxygen. With proper technic, pain is completely annihilated and the dental chair need never be one of dread. The dental operator will no longer be regarded as a being with horns and wearing a tail (perhaps like *Mephistopheles* in *Faust*, time will wear it away—I mean dispel that belief).

The technic of administering N_2O and O is not difficult, nor is it simple, contra-indications are almost nil. Nitrous oxide is a true narcotic, but in the initial administration of it the physiological property of analgesia is manifested, and during this stage the teeth can be operated upon perfectly free from pain and still the mind possess consciousness. This analgesia usually persists for several minutes even though the inhaler be removed. But since this period of analgesia is of short duration, whether the anesthetic is continued or discontinued, nitrous oxide must be neutralized or diluted with the admixture of air or oxygen to prevent approaching anesthesia, and also to supply the lungs with necessary oxygen, that analgesia may be maintained indefinitely.

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*Read before the St. Louis Society of Dental Science, 1914.

Patients to be operated upon must be submissive and tranquil in mind, and usually the least talking the better. A quiet operating room is paramount. The anesthetic should be warm, and administered at first with a copious quantity of air, gradually increasing the former and decreasing the latter until the proportion of air and nitrous oxid is about 25 to 75, respectively. If more nitrous oxide is required to obtain analgesia, begin to increase the nitrous oxide and substitute oxygen for air. If this does not produce analgesia, increase nitrous oxide and decrease the oxygen. Avoid the first symptom of cyanosis; anticipate these symptoms. Cyanosis is caused by insufficient air or oxygen, or the vapor coming too forcibly, or too light a pressure which would allow of incessant re-breathing (nasal sterosis), or other obstruction along the air passage. It will be impossible to obtain perfect results if the patient is not fully relaxed. Short and rapid breathing must be avoided.

As anesthesia or analgesia is prolonged, less nitrous oxide is required, and air or oxygen must be added. All patients are not easy to control under analgesia, as this stage is so transient, the exact proportions being necessary, while others will allow a wide variation of the proportions with little consequence. After the analgesia stage is reached it requires only a little deeper anesthesia to produce excitement, which must be avoided. The mind is then confused and sensation is exaggerated and voluntary muscles are no longer under control. Many times this stage is mistaken for incomplete analgesia because of the apparent pain and resistance to the mere touch of the tooth. If patients have been carried to this stage, start all over again.

Many patients will tell you when to start operating and will maintain the proper stage by inhaling through the nose or the mouth, or if they are allowed to hold the inhaler they will usually keep themselves at the proper stage of analgesia. It is true nitrous oxide is a dangerous drug, as it will asphyxiate in a remarkably short time if no oxygen is admitted with it. But you are not lost for symptoms of approaching danger.

It has been the writer's experience that many patients who have been operated upon under analgesia will at a subsequent sitting not require an analgesic. They have learned how to relax and apparently can put themselves in a frame of mind analogous to hypnotism or Christian Science—and the efferent nerves seem to be intercepted and the sensation is not conveyed to the brain. The operation in this case is just as painless as when under analgesia. A later sitting, though, may require analgesia again. Some patients prefer to endure a little pain than submit again to analgesia, this being due possibly to fear or to idiosyncrasy, but whatever may be the cause, they are now better patients and endure the dental work cheerfully.

The credit of the modern technic of anesthesia is due to Doctor Andrews, in 1869, and modern analgesia possibly is due Dr. A. P. DeFord, 1907, although Dr. A. C. Hewitt for over fifty years operated successfully under analgesia, his technic being to allow the inhaling of chloroform from a wide-mouth bottle held by the patient, but owing to the depressed feeling afterward and the aforesaid warning, the practice never became popular.

Somnoform, of recent development, is claimed by some to possess properties equal to nitrous oxide. While nitrous oxide and oxygen is indicated in the general routine of dental operations, and especially in cavity preparation, no dental operator would think of confining himself to one single anesthetic.

The writer uses five in his efforts to alleviate suffering. Where local or superficial anesthetic is indicated, a pledget of cotton, saturated in a solution of cocain and applied to the gum, renders painless the adjustment of the rubber dam, matrix, clamps, etc.

Where hypodermic syringe is indicated, novocain is used for subcutaneous injections. For the little patients with deciduous teeth to be extracted, nothing has proven so successful as ethyl chlorid sprayed upon the gum. The technic is simple and results are gratifying.

For unwilling little patients, the kind you cannot persuade to have their teeth removed or gums lanced, or who will not lower the pitch of their voices from the time they enter the reception room until under submission, this is the easiest, and less time is lost if you only recognize them from the beginning.

Thanks to the simplicity of the anesthetic or analgesic (whichever you wish to call it).

With a folded napkin break into it a large tube of somnoform and apply over the mouth and nose for inhalation. Almost instant quietude reigns and submissiveness prevails, a speedy recovery results and a smile of a pleasant experience follows.

With the glorious dawn of anesthesia and analgesia for all dental operations, there is no pardonable reason for pain or shock in dentistry.

SOME THINGS NEEDED IN OUR DENTAL LAWS

BY DR. J. W. DANIELS, SHIRLEY, INDIANA

IN INDIANA WE ARE PROUD of being able to feel that we have one of the best dental laws in the Union.

It is not my intention nor desire to criticise the persons who wrote our present law, but I have in mind one condition which greatly needs regulating, which seems to flourish under our law, as good as it is in other respects.

I know one man in Indiana who is not a dentist who owns two dental offices and depends upon such licensed men as he can hire to do the work. It has been necessary for him to change men frequently. In one of these offices at least three different men have operated during the last six months. One of these men is a gentleman of good habits and an honest practitioner, but he remained in that office only a few weeks because of the drunken habits of the proprietor. The other two operators are well known among their acquaintances for their unreliability. One drinks to excess and the other I have been told by one whom I consider reliable, is addicted to the use of cocain. I am not in position to know whether or not more than three different operators have been employed in the office I refer to in six months, but I have it from reliable authority that three different men were employed between January 1, 1914, and about the middle of March, 1914. How many different men have been employed since March I do not know. Any honest operator can realize at a glance something of the harm that may be done to an innocent public by an unscrupulous operator who has no intention of remaining in an office long enough to bear the responsibility of his operations.

I know another man whose efficiency has been greatly impaired by the use of strong drink for a period of several years. He failed to hold a practice of his own and now for three or four years has been going from one "parlor" to another, working on a salary. He worked in a "parlor" in Indianapolis for several months. The writer saw him several times while there, in a state of intoxication. He left Indianapolis and went to Chicago in search of a job. Failing to find employment in Chicago and having no money he walked to an Indiana city, hoping to find employment there. He walked into one of the "parlors" in this Indiana city, a perfect stranger to the proprietor, just as a tramp might do, and asked for work. The proprietor employed him and soon gave him entire charge of the office mentioned, while the proprietor spent his time in another office.

This tramp dentist worked to the satisfaction of the proprietor for a week or two when he went to one of the saloons and spent two or three days' time and all the money he had. Another dentist in the city saw the tramp dentist lying dead drunk in the saloon and telephoned to the employer, informing him of his whereabouts. The employer of the tramp went to the saloon and removed the tramp to his room, and as soon as the drunk had been slept off the tramp dentist was reinstated by his employer and assumed charge of the same office. A few weeks later something arose between the tramp dentist and his employer that was not satisfactory and the tramp left the employ of this "parlor" and at once entered the employ of the dentist who had first seen the drunken fellow in the saloon and phoned the information to the first employer.

The "dental parlors" thrive only because of their ability to employ licensed men who cannot hold a practice of their own. It is a well-known fact that a very large per cent. of such employes are boozers. I suppose they retain their license because of the difficulty in the way of the secretary of the State Board of Dental Examiners obtaining the necessary information on which he could base a reason for withholding the license.

My suggestion of how to deal with this problem is that a paragraph be inserted into our law making it a misdemeanor punishable by fine or imprisonment or both for any man who is not a licensed dentist to attempt to operate a dental office by hiring licensed men. Also make it a misdemeanor for any man whether a licensed dentist or not, operating a dental office, to employ any licensed man and allow him to perform operations in the mouths of patients without the prospective employe first having spent at least 60 or 90 days in such office. This would give the employer an opportunity to learn something of the habits and skill possessed by the prospective employe. It would also strike a severe blow to the operation of the illegitimate "dental parlor."

FILLING ROOT CANALS AND TREATMENT OF DECIDUOUS TEETH*

BY DR. W. R. ALVORD, DETROIT MICHIGAN

Having the canal ready to fill, I insert such an amount of a combination of equal parts of phenol compound and formocresol with thymolized calcium phosphate as a vehicle as I can easily convey to the cavity, and by means of a plain broach, pump the remedy into the canal. An excess is then placed in the cavity and with a ball of cotton, forced gently to place. Upon removing the cotton, the cavity is wiped clean and dried and a cement base inserted, suitable for the filling chosen. In drying the canals, I use the cotton points made by J. & J. They are very absorbent and stiff enough for the purpose. I use no gutta percha points in deciduous canals, as they do not absorb with the root. I employ the formulas of J. P. Buckley.

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*Clinic Michigan State Dental Society, 1914.

HEALTH CONSERVATION

THE NEW PROFESSIONALISM*

BY WESTON A. PRICE D.D.S., M.S., CLEVELAND, OHIO

I WANT TO ASSURE YOU that you are entirely safe from being bored by lengthy remarks from me. I am very, very happy to be here. It is always a very great pleasure to meet with our Indiana friends, for Ohio and Indiana have a great deal in common. I see I am to speak to you on "The New Professionalism," and I want you to go to Berlin and see an incident that happened a few years ago, when one of the princes from Holland was visiting Berlin. The Emperor of Germany, desiring to awe the prince, and to show him the mighty army of the German Empire and the splendid nation, to convince him that he could sweep down and take all of Holland, and in order that he might properly impress him, had one of his crack regiments march up in front of this prince, who was the highest representative of that land, and after they had marched by, he turned to the prince and said, "Can you beat that in Holland?" And without any cynicism or smile he said, "Yes, we can." And the Emperor of Germany was miffed at that reply and hurt. He said, "Bring up our crack regiments and march them past this man. He dares to insult us by inferring that they can beat this regiment." And so they marched up before this prince some more of their crack regiments, some that are never brought into public parade, and when they marched by the Emperor cheered those lusty fellows and said, "Can you beat that in Holland?" And with the same stoic countenance the prince replied, "Yes, we can." And the Emperor was more indignant, and he said, "Bring out my personal body guard. They have never yet been brought out for parade, but I want this man to see a regiment in which every man is six feet six inches tall;" and as that splendid regiment went by the Emperor thrilled, and said, "Can you beat that in Holland?" And the young prince said, "Yes, we can." The Emperor said, "What do you mean?" He said, "We can flood Holland seven feet deep."

We find as we study men and forces in this world that there is one force that is as much larger than all other personalities as that force and that engulfing ocean is greater as compared with those feeble German soldiers, and that one overwhelming wave is Personality, and you show me the personality that has in it the possibility that God has put in the possible range of one human life and soul, and I will show you something just as irresistible as is found in that deluge of water from the ocean. Look at our dental profession. I had the privilege of starting in a dental office with one who was supposed to be the best dental practitioner in a small town, and one of his first instructions was, "I want you to be very careful and not give away any of my ideas to these other men in town. They are nice fellows. You can go with them, but remember that the secrets of this office are ours." We have in our dental history one of the most beautiful transformations of that narrow, constricted Personality that you can find anywhere. We find ourselves growing out of it, just as an animal grows into a new form, taking an entirely new life; and we do also find, in the very nature of our practice, something that tends to make us narrow. Can you not see that dentist who was so hurt when somebody doubted him, he couldn't stand up and trust himself when he thought someone else doubted him? Haven't you seen the man who, when he thought someone had said an unkind word or falsehood, would deal in the same material? Haven't you seen in our profession that tendency for a man to get dreamy, and finally let those dreams come to be his master, and as they came to be his master, he finally made a theory like the picture of a cobweb so far as his proficiency was concerned? Haven't you seen in our profession, because we are kept away from the fresh air and the oxygen so much, that invigorates and makes new character, man after man pinched down until they did not have the characteristic resemblance to that forgiving principle? When we analyze our great city dental societies and find that there is scarcely a city in this country that has not been torn by dissension among its professional dentists, it appalls us. Just analyze it! It is nothing but the very thing I was speaking of—our men were not large enough to trust themselves when others doubted them. What does this mean? It means that as a profession we must first of all grow out of that constriction.

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*An address before the Indiana State Dental Society, 1914.

"If you can keep your head, when all about you
Are losing theirs, and blaming it on you;
If you can trust yourself when all men doubt you,
And make allowance for their doubting, too;
If you can wait, and not be tired by waiting,
Or, being lied about, not deal in lies;
Or, being hated, not give way to hating;
And yet not look too good nor talk too wise.

"If you can dream—and not make dreams your master;
If you can think, and not make thoughts your aim;
If you can meet with Triumph and Disaster
And treat those two imposters just the same;
If you can bear to hear the truth you've spoken
Twisted by knaves to make a trap for fools,
Or watch the things you gave your life to, broken,
And stoop and build them up with worn-out tools.

If you can make one heap of all your winnings,
And risk it on one turn of pitch and toss—
And lose, and start again at your beginnings,
And never breathe a word about your loss;
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the will which says you must hold on;

"If you can walk with crowds, and keep your virtue,
Or walk with kings, nor lose the common touch;
If neither foes nor living friends can hurt you;
If all men count with you, but none too much;
If you can fill the unforgiving minute
With sixty seconds' worth of distance run,
Yours is the earth, and everything that's in it,
And—which is more—you'll be a man, My Son."

We have not begun to grow until we get large enough so that no man can hurt us, and we have never gotten strong until we are strong enough to acknowledge our own weakness. And, still more, we have no right to claim that we love truth until we love truth, even though it denies and contradicts what we have said, more than we love to have someone endorse what we have said when it is wrong. What does it all mean? It simply means that if we, as a profession, are going to grow into the great possibilities of life, we must have an entirely new vision or relation for the world. For a man like that there is a new job. It is fixing up the world. There is not any sacrilege in that, no unkind inference in that. The fact is, God has placed us here to fix up the world. I think sometimes, when I read of that question by the disciples, when they came to the Master after He had healed the little child of the centurion, wanting an explanation, and He said, "And greater things than these shall ye do," saying it two or three times—Is it possible that a small human life, as we have it today, is doing or can do a greater work than these things Christ did?

I want you to follow through that type of personality that loves truth so much that it cherishes it more than anything else in the world, and you will see that practically all the benefits to mankind have come through that source. The death rate of Brazil today is thirty per thousand, of Indiana, fourteen per thousand, approximately. What does that mean? It simply means the difference in applied intelligence, and that simply means that somebody has been busy in gathering new truths in order that we might apply them. Think of what has been done in making over this old world! Fifty years ago the average life rate was twenty years; today it is nearly forty. Do you get the significance of that—the average lifetime nearly doubled in twenty years? The explanation is that someone had enough love for truth that he went after that one great element in order to help mankind. And we also find it where Doctor Emerson said we must go for it, and that is in the laboratory. While he acknowledged that clinical data might be valuable, he said it did not prove. We must go down to the crucible of exact analysis. When you take the scourges, and see that yellow fever went over the earth, and see that millions of people were wiped out by it, and today the earth is free from it, you see that character large enough to love truth more than anything else, and more than its own life, for the man that finally made the test for yellow fever by inoculation by the mosquito, gave his life, and did so cheerfully. When you take one after another of the great scourges like diphtheria, the cure for which in one year saves as many of the children of the United States as there are in all the schools of Indianapolis put together, you will know that it was brought about because somebody loved truth, and that love of truth, and that truth itself, is more mighty than anything else in the world.

Many references have been made to the opportunities in the dental profession. I wonder if any one in the dental profession has not got a large portion of that hunger and desire for truth that makes him wish to have it more than anything else in his practice. The fact that the dental profession has made contributions of something like $34,000 in fifteen months, in order that we might get more truth, is one of the best proofs we have that we have come into that heritage. The president has reminded me that he wishes me to tell you of the letters of encouragement we have been getting from men of great prominence in this campaign. Doctor Anderson, who is at the head of the Research Laboratory at Washington, commends in the very highest terms this movement. Another was a word from President Woodward of the Carnegie Institution at Washington, saying that he was more deeply impressed with the possibilities for good from this research work than by almost anything that had come to his attention during the past year. The dental profession has the opportunity to do just what Doctor Emerson has suggested, for he has brought to you the statement that vaccines as trusted in today are one of the weakest crutches we can lean upon. In that connection I want to say that the manufacturers of therapeutic products have been so eager to get on the market that there has scarcely been a month that they have not come to the commission and asked for its endorsement of some sort of vaccine for pyorrhea. Of course, the Commission cannot tolerate that. Doctor Billings, of Chicago, has said that he never saw a case of arthritis respond to vaccines. He has seen some respond to autogenous vaccine. We find ourselves a little in the position of the man who called for his attorney when he had been arrested and he said, "What can I do to get out?" The lawyer said, "What did you do?" "I did so and so." He said, "You can't be arrested for that." And the man replied, "I didn't send for you to tell me that. The fact is, I am in jail, and I want to know how to get out." There are some facts that are just about as irresistible as that man's position in jail, but when we realize that there is no such thing as contradiction of fact, we must understand that we may have only a part of the fact, and that vaccine treatment which produces, as he acknowledged, such splendid results, might be a therapeutic factor. There has been added to the unit of fact during the past few weeks one that is related to all that problem, and that puts a new face upon it. It is entirely possible to say that a large number of patients that Doctor Hartzell and his assistants have under their care have been improved in health, and that, not in months, but in a very few weeks, from a vaccine taken from a culture in the mouth, a very delicately selected culture, as over against one taken from a culture in which he has no faith. But the next step will be when you recognize that these germs may produce treatment therapeutically beneficial to these patients without proving that infection came from this origin. But in a few weeks Doctor Hartzell has, from a patient suffering from rheumatic arthritis, taken a pure culture, and injected that into animals, and produced characteristic arthritis in the animals. That has not been done before; that is a new clinical fact. It may be related to this whole problem. Truth is always properly related, and truths never conflict. In addition to that, they have produced myocarditis, endocarditis, affections of the aorta and abscess of the kidney. It is not conclusive that those patients have received infection from that source, but it is mighty suggestive.

I want to say something about the organisms to the dental foci from some other source. Within a week we have found in a tooth with a dead pulp a pure culture. That pure culture did not get in through the tooth. We haven't differentiated it; it is probably a "grip" bacillus. It is entirely possible for an abrasion, a point of infection, to exist at the apex of the tooth, and the systemic infection come in, as the doctor suggests, through an ulcer on the appendix or from the tonsils. I have seen a child recently with an extensive necrosis with a culture identical with the culture taken from the tonsil when removed, and this involved much of the maxillary tissue on the right side. The suggestion is that it may be produced at the weak point, to which the culture may go from other parts of the body. Suppose the vaccine has approached that area from other parts of the body. As he suggested, we do not stop the conflagration by putting out the fire in the first barn. No; but there is in the principle of treatment, the suggestion, borne out by much data, that it is not sufficient to clear out the mouth, the incidental source of infection, but there is a source for getting that culture to treat that case with, not necessarily a dead culture, but one with attenuated virulence. One patient had been treated with vaccine, stock vaccine, and with a vaccine made from a culture from the tonsil, and did not respond, and yet that patient was home with her family in five weeks, responded to a culture taken from a dental abscess. Suppose the dental abscess itself had been obliterated by the extraction of the tooth without making the culture. Immediately you have the proposition which you cannot answer and I cannot. Would that patient have gotten well merely from the extraction? Was it the result of extracting that tooth that gave her immediate relief? My belief is something was added to her system by that culture, because other cases have come where the same condition was brought about, and not a tooth was removed. That patient has increased in weight from 135 pounds to 175 pounds, is in better health than she has been for a great many years.

The presentation Doctor Emerson brought us tonight is one of the most grateful things I have heard in a long time, because it emphasizes the necessity for exact methods of study, just the thing we are trying to get into our profession. I know of no way we can make great progress except by this exact method. This splendid exponent we have heard here will not allow even the best clinical evidence to be weighed in the balance, when we may make an exact computation. I thank you again, in the interests of this great profession, in its efforts toward research work, and I want to say to you who were not here today that the dentists of Indiana have come to the support of this work to the extent of subscriptions of $3,200, in addition to their former subscriptions. It is not for the people of Indiana to applaud that, but it is for the admiration of the entire country. I want to bring you the most cordial appreciation of the entire profession for your splendid co-operation.

The Value of Illiteracy

A newly landed German immigrant who could speak broken English applied for the job of janitor of a flat-house in New York. The owner of the building was impressed with the candidate's earnestness and appearance, but when he found the German could neither read nor write he was forced to turn him down. Nevertheless, he liked the young foreigner's looks so much that he helped him to get work in a construction crew and took pains to keep in touch with him for a while.

At the end of four years the German walked in on his former benefactor. He was well dressed and cleanly shaven. He explained that he had been so busy he had not had time to acquire even the rudiments of an education, but he now owned a thriving grocery business and had saved some money.

"How much money?" inquired the American.

The German drew out a bankbook and showed that he had upward of ten thousand dollars on deposit, drawing interest.

"Good heavens!" said the American. "Fritz, I congratulate you. You're a wonder! You can't write your own name, and yet in four years you've made this much money all clear. I wonder what you would have made if you could read and write?"

The German thought a moment.

"A janitor," he said.

The chief merit of this story is that it is guaranteed as true by the man who saw the bankbook.

EDITORIAL

A Step in Advance

So far as we know, Ohio is the first state to introduce a special course of instruction in hygiene into its training schools for teachers.

The idea was suggested a few months ago at an organization meeting of the Ohio Public Health Federation, which consists of members of the State Medical Society, State Dental Society, Ohio State Society for the Prevention of Tuberculosis, Ohio State Pharmaceutical Society, Ohio Electric Medical Society, Ohio State Homeopathic Association, Ohio State Veterinary Association, Ohio Commission for the Blind, Ohio State Medical Board, Pharmacy Board, Dental Board and Ohio State Board of Health, and which has for its object the furthering of worthy health movements and legislation in the state.

At this meeting a number of representative men were asked to speak, among them F. W. Miller, State Superintendent of Public Instruction. Mr. Miller called attention to the recently enacted law requiring professional training of all the men and women who desire to enter the profession of teaching in the village and rural districts of this state. The normal school facilities being inadequate to prepare this army of trained workers that must be added to the teaching force each year, the legislature passed a new law making provision for establishing normal training departments in connection with first grade high schools, not to exceed three in each county.

Mr. Miller said that the course in physiology in these normal training schools places special emphasis upon hygiene, so that the young men and young women who receive their instruction in these schools and become the future teachers of our boys and girls, may be able to teach our children what to do to preserve their health.

He spoke particularly of the need of a better understanding of dental and oral diseases, the importance of oral hygiene, the care of the eyes, ears, etc., and asked the dental and medical professions for expert help along these lines. In response the Ohio State Dental Society and Ohio State Medical Society agreed to have delivered in every one of the county normal schools a series of lectures upon such subjects as "The Care of the Teeth and Oral Hygiene," "First Aid to the Injured," "Hygiene of the Home," "Hygiene of the Community," "Hygiene of the Eye, Ear, Nose and Throat," "The Feeble Minded and the Epileptic," "Hygiene of Womanhood," and other subjects. Mr. Miller thought that these lectures and demonstrations would be of priceless value to those who are to instruct our youth, for these professional men, from their long experience, can bring to these teachers a great fund of information which cannot be gotten from text books alone.

A committee was appointed at that time to devise a general plan of work and procedure and to make outlines for each of these lectures. Since then the lectures have been prepared by men selected from the professions for this work. These lectures will be printed and copies sent to dentists and physicians who are to deliver the lectures to the county normal training schools, which may be in their vicinity. This being made a part of the course of instruction of these teachers, with the idea that they will subsequently convey the information to children of the public schools, makes it the most commendable work of the kind ever undertaken in our schools.

Later THE DENTAL SUMMARY may be able to publish some of these lectures for the aid of those men in other states who may become interested in a like movement.

NEW PUBLICATIONS

Text Book of Dental Pathology and Therapeutics. Based on the Original of Henry H. Burchard, M.D., D.D.S. Rewritten by Otto E. Inglis, D.D.S., Professor of Dental Pathology and Therapeutics in the Philadelphia Dental College. Fifth edition, thoroughly revised. Octavo, 807 pages, with 708 engravings and one colored plate. Cloth, $5.00, net. Lea & Febiger, Philadelphia and New York, 1915.

This standard work is well known throughout the dental profession and we welcome the new revised edition. As in earlier editions, the subject of pathology is given very extended consideration. The author makes it plain that a rational use of therapeutics can be based only on a full understanding of normal conditions. Having devoted about 300 pages to general pathology and embryology, anatomy and histology of the jaws and teeth, the author treats the subject of affections of the enamel and dentine, of the dental pulp, of the pericementum and pericemental diseases beginning at the gum margin.

Operative procedure, the preferred instruments and general therapeutic measures are clearly set forth. The suggestions in regard to local anesthesia and in regard to methods of obtaining analgesia are based on the recent and important advances in these fields. An extensive list of dental obtundents with indications for their employment is presented. The consideration of Pyorrhea Alveolaris is extremely detailed, and presents the latest information on this much discussed subject. Its causes and symptomatology, its relation to deeply seated gingivitis, its bacteriology, diagnosis and treatment are fully considered. The sections on bone infections associated with dental lesions, on X-ray and vaccine therapy, on infections and on sterilization are not only distinctly up-to-date in tone and in the information presented, but peculiarly useful to the practitioner because of the care with which the minutiæ of technic are considered.

The chapters dealing with the impaction of teeth and with the conditions which call for the employment of a special surgical operator are worthy of special note. The section devoted to pharmacology has been greatly enlarged in scope and rendered more useful by a very complete index of the drugs and remedial measures referred to.

Notes on Dental Anatomy and Dental Histology (*Human and Comparative*). By T. W. Widdowson, Licentiate in Dental Surgery, Royal College Surgeons, England, Late House Dental Surgeon to Liverpool Dental Hospital, contributing editor to Oral Health, Toronto, Can., author of "The Care and Regulation of Children's Teeth", "Notes on Dental Surgery and Pathology," etc. Third and revised edition. London: John Bale, Sons & Danielsson Ltd. Pub., Price net, 7s6d.

This is intended as a companion to the author's "Notes on Dental Surgery and Pathology." In this third edition many illustrations, explanatory of the text, and additional matter have been introduced, and although the designation "A Pocket Tomes" has been retained, the work contains all the most important facts and theories relating to Dental anatomy and histology. It is illustrated with more than one hundred illustrations and interleaved with blank pages for the reader's own notes and drawings.

The book will prove helpful to students in mastering these subjects and to busy practitioners as a ready work of reference.

Ethics and Jurisprudence for Dentists. By Edmund Noyes, D.D.S., Professor of Ethics and Jurisprudence in Northwestern University Dental School, Chicago: Published by the the author, Stewart Bldg. Price, net, $2.00

This work is divided into three parts: the first treating ethics in general; the second, professional ethics; and the third, dental jurisprudence.

In speaking of the first subject, general ethics, which is treated at length, the author states that "it is his belief that it is worth while for young men preparing themselves for any profession or business to give some time to a study of the fundamental principles and sanctions of morality, and the powers and dispositions of mind and heart by which the conduct of life should be determined and the rules of duty should be obeyed; in other words, the duties and virtues which characterize good men. Professional ethics can have little authority and command little respect unless it is understood to rest upon solid foundation of the general principles of morality."

In part second, professional ethics, the author treats the subjects, Ethics in Business, of Employment, of Professions, Advertising, Winning a Practice, Duties to Patients, Duties of Dentist to other Dentists and the Profession, Papers read at Society Meetings, Fees, Commissions, Codes of Ethics, Patents, and Principles of Medical Ethics of the American Medical Association.

Part third is devoted to such matters as come under the head of dental jurisprudences.

The book contains helpful suggestions for anyone who may read it.

It is well printed on non-glazed paper and substantially bound.

Pathology and Bacteriology for Dental Students. By Guthrie McConnell, M.D., Assistant Surgeon Medical Reserve Corps, U. S. N., formerly Professor of Pathology and Bacteriology in the Philadelphia Dental College. 12 mo. of 309 pages with 108 illustrations. Philadelphia and London; W. B. Saunders Company, 1915. Cloth, $2.25 net.

This work presents in condensed form the principles of pathology and bacteriology, with special reference to their needs by the dental student. The author says: "It has become evident, as a result of several years of teaching, that the text books as prepared for medical students contain much that can well be omitted from the dental curriculum. For that reason this manual has been prepared. One that is expected to contain a full presentation of general pathology and bacteriology and what additional along special lines as has been considered advisable. With a complete knowledge of the basic principles of these subjects the student will then be able to apply them in his work, and later, if he so desires, to specialize."

The subjects given consideration are: Pathology, Disorders of Metabolism, Circulatory Disorders, Retrogressive Processes, Cell Division, Inflammation and Regeneration, the Specific Inflammations (Granulomata), Progressive Tissue Changes, Tumors or Neoplasms, Special Pathology of the Mouth, Bacteria, Sterilization and Disinfection, Bacteriologic Methods, Specific Micro-organisms, Infection, Laboratory Technic. A concisely written and well arranged text.

Report on Odontomes by the Committee appointed by the British Dental Association, consisting of Drs. D. P. Gabell, W. W. James and J. L. Payne. Published by the British Dental Association, 19 Hanover Sq., London, W. Price, 7s.6d. net.

This report on odontomes was written at the request of the Board of the British Dental Association, who desired the museum committee of the annual meeting, held in London in 1906, to prepare an extended and illustrated edition of the catalog, which was rapidly compiled for use at that meeting.

The opportunities afforded by this collection of examining and comparing specimens, and also of obtaining the opinions and criticisms expressed by visitors, among whom were several well-known authorities on these tumors, convinced the members of the committee that some alteration of the generally-accepted views upon odontomes was necessary.

In order to thoroughly investigate the subject, notes of the recorded cases were collected, and an attempt was made to examine all the publications in which tooth tumors had been described.

The result has been a valuable work, the text of which covers 135 pages. In the book the odontomes are classified as follows:

1. *Epithelial Odontomes*—Where the abnormal development takes place in the dental epithelium alone; Multiocular cysts, dentigerous cysts, dental cysts.

2. *Composite Odontomes*—Where the abnormal development takes place primarily in the dental epithelium, and secondarily in the dental papilla, and may occur in the follicle also.

(*a*) Where the abnormal development of the dental epithelium is such that the formation of numerous irregular dentine papillæ results, which are calcified in one mass sporadically: Complex composite odontomes, compound composite odontomes.

(*b*) Where the abnormal development of the dental epithelium is such that the formation of two or more tooth-like papillæ results and are calcified as one mass: Germinated composite odontomes, gestant composite odontomes and enamel nodules.

(*c*) Where the abnormal development of the dental epithelium is such that the formation of a dilated portion of the dentine papilla results and is calcified as one mass: Dilated composite odontomes.

3. *Connective Tissue Odontomes*—Where the abnormal development takes place in the dental tissues of mesoblastic origin alone: Fibrous odontomes, cementomes.

Under the first group eighty-two specimens are described; under the second group, one hundred and twenty-nine specimens are described; under the third group, twenty specimens are described. About one hundred excellent engravings are used to illustrate the text.

It is a most valuable work and reflects great credit on the members of the British Dental Association.

Obituary

Dr. A. W. Evans, one of Monroe's prominent professional men, died early Sunday morning, May 16th, from the effects of pernicious anaemia.

He was born October 7th, 1876 at Quincy, Mich. In 1892 he was matriculated as a student in the Dental Department of the Detroit Medical College, and graduated therefrom in June 1895. He practiced his profession in Detroit until the outbreak of the Spanish American War, when he enlisted for service in a Michigan Company. At the close of the war he returned to Michigan, locating at Monroe, where he has since been engaged in the work of his profession.

The world instinctively pays deference to the man whose success has been worthily achieved and whose prominence is not the less the result of an irreproachable life than of natural talents and acquired ability in the field of his chosen labor. He will be missed in his field of endeavor.

The funeral was held Wednesday morning, May 19th, from St. John's Church, Rev. T. J. Hennessey officiating.

He leaves wife, daughter and sister to mourn their loss.

MISCELLANY

Legislation, the Result of Organization

Columbus, Ohio, May 18, 1915

Editor The Dental Summary.

Dear Sir: I am enclosing a copy of the Dental Bill, Senate Bill No. 84, just passed by the 81st General Assembly of Ohio, and in so doing congratulate the Component Societies and their Legislative Committees whose earnest support and co-operation, with a similar committee in the Northern Ohio Society and the Legislative Committee of the State Dental Society, made it possible to enact this bill into a law.

It was introduced in the Senate February 9, 1915 and was referred to the Public Health Committee in the Senate and House respectively. It was reported out of this committee February 25, and passed the former March 2, twenty-nine votes for, none against. It was reported out of the committee in the House March 18, and when before the House for passage on April 8, Mr. H. L. Federman, of Hamilton county, amended the bill, giving the right of appeal to the common pleas court, in cases of refusing, suspending or revoking a license by the state board. With this amendment the vote in the House resulted in 91 yeas and 2 nays; Mr. Wm. E. Enteman, of Lucas, and Mr. W. F. Garver, of Holmes, voting in the negative. Mr. Federman's amendment was found to conflict with sections 1326 and 1327 of the General Code, in that there was a right of appeal to the Governor and Attorney General. On April 22, the original amendment of Mr. Federman was withdrawn by consent of the House, and sections 1326 and 1327 were amended to conform to the spirit of his original amendment. Section 1329-1 was also amended by adding a penalty. The bill was then voted upon as amended, and the result was: yeas, 92; nays, none; Messrs. Enteman and Garver voting in the affirmative. The House amendments were concurred with in the Senate April 28: yeas, 21; nays, none.

It will be seen by the above that notwithstanding persistent opposition, this bill had unanimous support in both branches of the Assembly, due to our present efficient organization. That the members of the profession may become more generally acquainted with the dental law of Ohio, the unamended sections are included, and in the amended sections, stars indicate omissions and italics new matter.

While the dental profession of Ohio, for which I speak, extends its most grateful acknowledgment to each member of the legislature who supported the bill, it is particularly indebted to Senator E. G. Lloyd, of Columbus, for introducing the bill; Senators W. D. Tremper and C. F. Bauer, both members of our profession, for their keen interest in its welfare; in the House to Hon. F. E. Whittemore, of Summit, who, on April 8, moved that it be taken out of its regular order on the calendar and considered at once, which motion was agreed to, and to Hon. Wm. P. Ellis, of Geauga, for fathering the bill there; to Hons. W. S. Hoy, of Jackson, and John F. Kramer, of Richland, for their earnest support on the floor.

While many of our men have given more or less attention to the bill, our thanks are due to Dr. Holston Bartilson for invaluable assistance and data procured by him in his official capacity as secretary of the State Dental Board; to Dr. Charles Swope, chairman of the Legislative Committee, for his firm stand for the interests of the dentists throughout the State, and for his untiring efforts and sacrifice of time on behalf of this measure.

Yours very truly,

EDWARD C. MILLS

Senator Erastus G. Lloyd

SENATOR ERASTUS G. LLOYD, who introduced the new Ohio dental bill in the Senate. The bill was carried through both branches of the legislature with but two dissenting votes.

Senator Lloyd, of Columbus, representing the Tenth District, was born December 12, 1876, at Portsmouth. He was graduated at Otterbein University and Ohio State University and has been engaged in the practice of law in Columbus for a number of years. He never held a public position prior to being elected as a Democrat to the Ohio Senate in 1912. He has served two terms in the State Senate as the Democratic member from this district. His service has been especially commendable. He introduced at the last session and secured the passage of more bills than any other man. He was tireless in his efforts to advance our educational and professional interests; he has done a great service in raising the educational requirements of our schools and universities, and the professional standards of our state.

New Dental Law for Ohio

Introduced in Senate February 9, 1915 as Senate Bill 841. Reported out Public Health Com., February 25th. Passed Senate March 2d by unanimous vote. Reported out Public Health Com. in House March 18th. Passed the House April 8th, two dissenting votes. Reamended and passed House by unanimous vote April 22; concurred in by Senate by similar vote, April 28.

To amend sections 1314, 1315, 1316, 1317, 1318, 1325, 1326, 1327, 11444, 12711, 12712, 12713, 12714 and 12715 of the General Code and to supplement sections 1317, 1321 and 1329 of the General Code by adding thereto sections 1317-1, 1321-1 and 1329-1, relating to the practice of dentistry.

Be it enacted by the General Assembly of the State of Ohio:

SECTION 1. That sections 1314, 1315, 1316, 1317, 1318, 1325, 11444, 12711, 12712, 12713, 12714 and 12715 be amended and that sections 1317, 1321 and 1329 be supplemented by adding thereto sections 1317-1, 1321-1, 1329-1 to read as follows:

SEC. 1314. The governor, with the advice and consent of the senate, shall appoint a state dental board consisting of five persons each of whom *shall be a graduate of a reputable dental college and* shall have been in the legal *and reputable* practice of dentistry in the state at least five years next preceding his appointment. One member shall be appointed each year *as the respective terms of the present incumbents expire*, and shall serve for the term of five years and until his successor is appointed and qualified. No person so appointed shall be an officer of a dental college or a member of the faculty thereof, or serve to exceed two terms.

SEC. 1315. The state dental board shall organize by the election from its members of a president * * * *and* a secretary * * *. It shall hold a meeting on the * * * *fourth Monday* in June and October of each year, and other meetings as it deems necessary at such times and places as the board designates. The October meeting shall be held in the city of Columbus; the June meeting may be held at such place as the board designates. A majority of the members of the board shall constitute a quorum but a less number may adjourn from time to time. The board shall make such reasonable rules and regulations as it deems necessary, provided, however, that it shall require the concurrence of a majority of the members of the board to grant, to refuse, or to revoke a license.

SEC. 1316. Before entering upon the discharge of the duties of his office, the secretary * * * of the state dental board shall give a bond to the * * * *state in the sum of two thousand dollars conditioned for the faithful discharge of the duties of his office, the premium for such bond to be paid from the funds belonging to the board. Such bond, with the approval of the board and oath of office endorsed thereon*, shall be deposited with the secretary of state and kept in his office. Each * * * *week* all moneys received by the secretary shall be paid * * * *by him into the state treasury to the credit of a fund for the use of the state dental board.*

SEC. 1317. Each member of the state dental board shall receive ten dollars for each day actually employed in the discharge of his official duties, and his necessary expenses incurred. The secretary shall receive an annual salary to be fixed by the board, and his necessary expenses incurred in the discharge of his official duties. The compensation and expenses of the secretary and members and the expenses of the board, shall be paid * * * *from the fund in the state treasury for the use of the board on the requisition signed by the president and the secretary of the board and the warrant of the auditor of state.*

SEC. 1317-1. *The state dental board may affiliate with the national association of dental examiners, as an active member, and pay regular annual dues to said association and may send a delegate to the meetings of the said national association of dental examiners; such delegate shall receive the compensation provided in section 1317 of the General Code.*

SEC. 1318. The state dental board shall have an official seal and shall keep a record of its proceedings, a register of persons licensed as dentists and a register of licenses by it revoked. At reasonable times, its records shall be open to public inspection, *and it shall keep on file all examination papers for a period of ninety days after each examination.* A transcript of an entry in such records, certified by the secretary under the seal of the board, shall be evidence of the facts therein stated.

SEC. 1319. The state dental board may hear testimony in matters relating to the duties imposed upon it by law, and the president and secretary of the board may administer oaths.

SEC. 1320. Unless previously qualified as provided by law, no person shall practice dentistry in this state until he has obtained a license from the state dental board as hereinafter provided.

SEC. 1321. Each person who desires to practice dentistry within this state shall file with the secretary of the state dental board a written application for a license and furnish satisfactory proof that he is at least twenty-one years of age, of good moral character, and present evidence satisfactory to the board that he is a graduate of a reputable dental college, as defined by the board. Such application must be upon the form prescribed by the board and verified by oath.

SEC. 1321-1. *The applicant shall also present with his application a certificate of the state superintendent of public instruction, that he is possessed of a general education equal to that required for graduation from a first-grade high school in this state. Said superintendent of public instruction shall issue a certificate without examining the applicant, provided said applicant presents to him one of the following credentials: A diploma from an approved college granting the degree of A.B., B.S., or equivalent degree; a certificate showing graduation from a high school of the first grade, or from a normal or a preparatory school, legally constituted, after four years of study; a teacher's permanent or life high school certificate; a certificate of admittance by examination to the freshman class of an approved college granting the degree of A.B., B.S. or equivalent degree. In the absence of the foregoing credentials and before issuing such certificate the applicant shall be examined by said superintendent of public instruction, in such branches as are required from a first grade high school and to pass such examination shall be sufficient qualification to entitle such applicant to a certificate; provided, however, that the superintendent of public instruction may designate any county superintendent of schools to hold such examinations at such times and places as may be necessary or convenient. The fee for such examination shall be three dollars and the fee for certificate shall be one dollar, both payable to said superintendent of public instruction and by him paid into the state treasury to the credit of the general revenue fund. Granting of certificates by examination by said superintendent of public instruction, and acceptance by said superintendent of certificates of admittance by examinations to the freshman class of approved colleges granting the degree of A.B., B.S. or equivalent degree, shall cease after January first, 1919. This shall not apply to students already enrolled in accredited dental colleges.*

SEC. 1322. An applicant for a license to practice dentistry shall appear before the state dental board at its first meeting after the filing of his application, and pass a satisfactory examination consisting of practical demonstrations and written or oral tests, or both, in the following subjects: Anatomy, physiology, chemistry, materia medica, therapeutics, metallurgy, histology, pathology, bacteriology, prosthetics, operative dentistry, oral surgery, anesthetics, orthodontia and oral hygiene.

SEC. 1323. If such applicant passes the examination, he shall receive a license from the state dental board attested by its seal and signed by the president and secretary, which shall be conclusive evidence of his right to practice dentistry in this state. If the loss of a license is satisfactorily shown, a duplicate thereof shall be issued by the board.

SEC. 1324. The state dental board may issue a license without examination to an applicant who furnishes satisfactory proof that he is a graduate from a reputable dental college of a state, territory or district of the United States, and holds a license from a similar dental board, under requirements equal to those of this state, or who, for five consecutive years next prior to filing his application, has been in the legal and reputable practice of dentistry in a state, territory or district of the United States and holds a license from a similar dental board thereof, if in either case the laws of such state, territory or district accord equal rights to a dentist of Ohio holding a license from the state dental board, who removes to, resides and desires to practice his profession in, such state, territory or district. No license shall be issued under this section unless authorized by an affirmative vote of all the members of the board present at such meeting.

SEC. 1325. The state dental board may revoke *or suspend* a license obtained by fraud or misrepresentation, or if the person named therein * * * is *convicted subsequent to the date of his license of a felony involving moral turpitude, or becomes guilty of chronic or persistent inebriety or addiction to drugs; or if the person holding such license shall advertise with a view of deceiving the public; or be guilty of any grossly immoral conduct likely to deceive or defraud the public; or which disqualifies the applicant to practice with safety to the people.*

SEC. 1326. No action to revoke *or suspend* a license shall be taken until the accused has been furnished a statement of the charges against him and notice of the time and place of a hearing thereof. The accused may be present at the hearing in person, by counsel, or both. The statement of charges and notice may be served personally upon such person or mailed to him at his last known address at least twenty days prior to the hearing. If upon such hearing the board finds the charges are true, it may revoke *or suspend* the license. Such revocation shall take from the person named in a license all rights and privileges acquired thereby.

SEC. 1327. A stenographic report of each proceeding to revoke *or suspend* a license shall be made at the expense of the State Dental Board, and a transcript thereof kept on its files. A person * * * *who has been refused a license for any cause other than failure to pass the examination or* whose license has been revoked *or suspended* may file with the secretary within thirty days of the decision of the board a written notice of appeal therefrom *to the common pleas court of the county in which the person whose license has been suspended or revoked resides.* Upon filing such notice the secretary shall transmit * * * to the *clerk of such court* the record of such proceedings * * *. *Such court shall thereupon hear and determine such case as in other cases of appeal. The judgment of the common pleas court may be reviewed upon proceedings in error in the court of appeals.*

SEC. 1328. An applicant for a license to practice dentistry in this state shall pay to the secretary of the state dental board, the following fee:

An applicant for a license granted upon an examination, twenty-five dollars. Such fee shall not be refunded unless the applicant is unavoidably prevented from attending the examination, but he may be examined at the next regular or special meeting of the board without additional fee.

An applicant failing at first examination may be re-examined at the next regular or special meeting of the board without an additional fee.

An applicant for a license without examination, with license from a board other than of this state, twenty-five dollars.

An applicant for a duplicate license granted upon proof of loss of the original, five dollars.

SEC. 1329. A person shall be regarded as practicing dentistry who is manager, proprietor, operator or conductor of a place for performing dental operations or who, for a fee, salary or other reward paid or to be paid either to himself or to another person, performs dental operations of any kind, treats diseases or lesions of human teeth or jaws, or attempts to correct malpositions thereof, or who uses the words "dentist," "dental surgeon," the letters "D.D.S.," or other letters or title in connection with his name, which in any way represents him as being engaged in the practice of dentistry.

SEC. 1329-1. *It shall be unlawful for any person or persons to practice or offer to practice dentistry or dental surgery, under the name of any company, association, or corporation, and any person or persons practicing or offering to practice dentistry or dental surgery shall do so under his name only; any person convicted of a violation of the provisions of this section shall be fined for the first offense not less than one hundred dollars nor more than two hundred dollars, and upon a second conviction therefor, his license may be suspended or revoked, as provided in section 1325 of this act.*

SEC. 1330. Nothing in this act applies to a bona fide student of dentistry in the clinic rooms of a reputable dental college or under the direct supervision of a preceptor who is a licensed dentist in this state, during the regular vacation intervals of a college course, if he has matriculated and is pursuing consecutive courses of study in a reputable dental college.

SEC. 1331. Nothing in this act applies to a legally qualified physician or surgeon unless he practices dentistry as a specialty, or to a dental surgeon of the United States army or navy; or to a legal practitioner of dentistry of another state.

SEC. 1332. All fines or forfeitures of bond in an action for violation of a provision of law relating to the practice of dentistry, shall be paid by the court receiving it, to the secretary of the state dental board.

SEC. 1333. The secretary of the state dental board shall enforce the provisions of the laws relating to the practice of dentistry. The prosecuting attorney of a county, or the solicitor of a municipality, wherein a provision of this act is violated, shall, when so requested by the secretary of the board, take charge of and conduct the prosecution.

SEC. 1334. The state dental board shall make an annual report to the governor, containing a statement of moneys received and disbursed, and a summary of its official acts during the preceding year.

SEC. 11444. Public officers, clergymen, priests, physicians, *dentists*, attorneys at law, members of the police force, firemen employed by a municipal authority, acting volunteer members of companies to extinguish fires, organized in and under the control of a municipality and all persons serving as active members thereof for five consecutive years, and every person over seventy years old, are exempt from jury service.

SEC. 12711. Whoever engages in the practice of dentistry and fails to keep displayed in a conspicuous place in the operating room in which he practices, and in such manner as to be easily seen and read, the license granted him pursuant to the laws of this state, shall be fined not less than fifty dollars nor more than one hundred dollars.

SEC. 12712. Whoever sells, or offers to sell, a diploma conferring a dental degree, or a license granted pursuant to the laws of this state, or procures such diploma or license with intent that it shall be used as evidence of the right to practice dentistry as defined by law, by a person other than the one upon whom such diploma was conferred, or to whom such license was granted, or with fraudulent intent, alters such diploma or license, or uses or attempts to use it when it is so altered, shall be fined not less than one hundred dollars nor more than two hundred dollars * * *.

SEC. 12713. Whoever, being a manager, proprietor. operator or conductor of a place for performing dental operations, employs a person who is not a licensed dentist to perform dental operations as defined by law, or permits such person to practice dentistry in his office, or * * * *whoever* practices dentistry under a false name, or assumes a title, or appends or prefixes to his name, letters which falsely represent him as having a degree from a legal dental college, or makes use of the words "dental college" or "school" or equivalent words, when not lawfully authorized to do so, or impersonates another at an examination held by the state dental board or knowingly makes a false application or a false representation in connection with such examination, shall be fined not less than one hundred dollars nor more than two hundred dollars * * * .

SEC. 12714. Whoever violates any provision of law relating to the practice of dentistry, or the application for examination and licensing of dentists, for which no specific penalty has been prescribed, shall be fined not less than fifty dollars nor more than one hundred dollars * * *.

SEC. 12715. A second or subsequent conviction under any of the next four preceding sections, shall be punished by the maximum penalties prescribed therein, * * * *or imprisonment in a jail or workhouse not less than ten days nor more than sixty days or by both fine and imprisonment.*

Section 2. That original sections 1314, 1315, 1316, 1317, 1318, 1325, 1326, 1327, 11444, 12711, 12712, 12713, 12714 and 12715 of the General Code be and the same are hereby repealed.

Signed by Governor F. B. Willis, May 18, 1915.

Dentist on the Texas Board of Health

Dr. Bush Jones, Dallas, Texas, has been appointed a member of the Dallas (Texas) Board of Health. This is the first time in the history of Texas that a dentist has been appointed on any Board of Health in that state,

SOCIETY ANNOUNCEMENTS

The Indiana State

If the 1915 meeting of the Indiana State Dental Association may be taken as evidence of strength, harmony and efficiency, the body turned over by the retiring president, Dr. Otto U. King, to the new executives, headed by Dr. Robert R. Gillis, of Hammond, president, is one of the very best and strongest within the ranks of the dental profession. The meeting was unique in the history of the Indiana Association, not only in that the program was made up entirely of Indiana talent, but that the attendance was unprecedented, the interest manifested most gratifyingly unusual, and the character of papers and discussions far above the average. Doctor King steps out of the harness after many years of service to the state organization, leaving behind him a record of accomplishment visible on every hand in a united, earnest, intelligent and efficient body, one of the strongest components in the national body, in order that he may concentrate his efforts for the success of the latter, of which he is the untiring and most competent secretary.

Papers and discussions will appear in future numbers of THE DENTAL SUMMARY.

Following officers were elected: President, R. R. Gillis, Hammond, Ind.; vice-president, John O. Zubrod, Evansville, Ind.; board of trustees, J. B. Howard, Indianapolis, L. W. Daily, Bluffton, J. W. McCurdy, Ft. Wayne; state dental examiners, H. C. McKittrick, Indianapolis, H. C. Sexton, Shelbyville, Chas. E. Redmond, Peru.

A ringing resolution was offered by President-Elect Gillis and unanimously and enthusiastically adopted, endorsing the action of President Wilson in the Lusitania incident, and offering the professional services of the Indiana State Dental Association, should occasion arise.

American Society of Orthodontists

There will be a meeting of the American Society of Orthodontists, held Monday, August 30, 1915, at 9:30 A.M., at San Francisco, in the room assigned to the Orthodontia Section of the Panama-Pacific Dental Congress. It is respectfully requested that as many members of the American Society of Orthodontists as possible be present.

F. C. KEMPLE, *President*
F. M. CASTO, *Sec'y-Treas.*

Tennessee State Dental Association

The forty-eighth annual meeting of the Tennessee State Dental Association will be held at Sewanee, Tenn., June 24, 25 and 26, 1915. A fine meeting is assured.

C. O. RHEA, *Secy.*

Georgia State Dental Association

The forty-sixth annual meeting of the Georgia State Dental Association will be held in Atlanta, Ga., at the Piedmont Hotel, June 17th, 18th and 19th, 1915, beginning at 11:00 A.M., Thursday, June 17th. We have every assurance that this will be an interesting meeting.

Every ethical dentist in Georgia is respectfully invited to attend, and become a member of this organization. Also, a most cordial invitation is extended to members of other associations to meet with us.

For further information address M. M. FORBES, *Secy.*,
803-4 Candler Bldg., Atlanta, Ga.

Northeastern Dental Association

The Northeastern Dental Association will hold its twenty-first annual meeting in Springfield, Mass., on October 13,14,15, 1915.

Rhode Island Dental Board

A regular meeting of the Rhode Island State Board of Dental Examiners will be held at the State House, Providence, R. I., June 23, 24 and 25, 1915. For further information apply to the secretary, William B. Rogers, 171 Westminster St., Providence, R. I.

Ohio State Dental Board

The practical examination will take place on Monday, Tuesday and Wednesday, June 14th, 15th and 16th, at the Ohio State University College of Dentistry, in Columbus, Ohio. The theoretical examination will be given at the Ohio State University Armory (which is situated on the University Campus) on Thursday, Friday and Saturday, June 17th, 18th and 19th.

R. H. VOLLMAYER, *Secy.*,
Toledo, Ohio

Indiana State Board

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing June 14th, and continuing six days.

For application blanks and full particulars address Dr. Fred J. Prow, Secretary, Bloomington, Ind.

Pennsylvania State Board

The next examination of the Pennsylvania Board of Dental Examiners will be held in the Musical Fund Hall, Philadelphia, and the College of Pharmacy Building, Pittsburgh, on Wednesday, Thursday, Friday and Saturday, June 9, 10, 11 and 12, 1915, the practical work being held on Wednesday, June 9th, at 1:00 o'clock. Application papers can be secured from the Department of Public Instruction, Harrisburg. For further information address the secretary,

ALEXANDER H. REYNOLDS, *Secy.*,
4630 Chester Ave., Philadelphia, Pa.

Arkansas Examination

The Arkansas State Board of Dental Examiners will hold an examination at the Marion Hotel, in Little Rock, Ark., on Monday, Tuesday and Wednesday, June 21, 22 and 23, 1915. Applicant must be a graduate of a reputable dental school. Examination theoretical and clinical. Application and fee should be in the hands of the secretary fully two weeks before the examination. For further particulars, write

IRVIN M. STERNBERG, *Secy.*,
Fort Smith, Ark.

North Carolina State Board

The next regular meeting of the North Carolina State Board of Dental Examiners will be held at Wrightsville Beach, Wilmington, N. C., beginning promptly at nine o'clock on Monday morning, June 21st. Full information and application blanks may be secured by addressing the secretary.

DR. F. L. HUNT, *Secy.*,
Asheville, N. C.

New Jersey State Examining Board

The State Board of Registration and Examination in Dentistry of New Jersey will hold its annual meeting and examination in the Assembly Chamber at the State House, Trenton, N. J., on June 28th, 29th and 30th, 1915. License fee, $25.00. No interchange of license.

J. C. FORSYTH, *Secy.*,
Trenton, N. J.

Idaho State Board of Dental Examiners

The next meeting of the Idaho State Board of Dental Examiners will be held in Boise, beginning Tuesday, July 6, 1915, at 9:00 A.M., at the state capitol.

For application blanks and any information, address

ALBERT A. JESSUP, D.D.S., *Secy.*,
Box 1414, Boise, Idaho.

South Dakota Board of Dental Examiners

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, S. D., July 13th, at 9:00 A.M. sharp continuing three days. All applications must be in the hands of the secretary by July 1st. Fee, $25.00. Address

ARIS L. REVELL, *Secy.*
Lead, S. D.

Wisconsin State Board of Dental Examiners

The Wisconsin State Board of Dental Examiners will convene in Milwaukee, at Marquette University, on June 21, 1915, at 2:00 P.M., for examination of applicants to practice in Wisconsin.

High school diploma, application and $25.00 fee to be filed with the secretary ten days prior to above date.

Dental diploma to be presented in advance of the examination.

Junior dental students presenting a clear card for two years' unconditional work from a reputable dental college and filing a high school diploma, or its full equivalent, will be permitted to participate in the theory examination in the following six major subjects: Anatomy, Physiology, Histology, Chemistry, Bacteriology, Materia Medica. Satisfactory grades made in these subjects will be credited at subsequent examinations.

Special application blanks for this examination and $10.00 fee, together with high school credits, to be filed ten days in advance.

S. H. CHASE, *Pres.*
W. T. HARDY, *Secy.*
404 Majestic Bldg., Milwaukee, Wis.

Wyoming State Board of Dental Examiners

The Wyoming Board of Dental Examiners will meet at Cheyenne, Wyoming in the Senate Chamber at the state capitol on the 29th and 30th of June, and 1st day of July, 1915.

The written examination consists of Anatomy, Physiology, Histology and Bacteriology, Chemistry and Metallurgy, Oral Surgery, Anesthetics, Operative and Prosthetic Dentistry, Materia Medica and Therapeutics, Prophylactics and Orthodontia.

Applicants must present a full plaster model of upper and lower jaws with teeth; also one without teeth. Practical work will be required from all candidates taking the examination. The candidate is required to furnish his own operating instruments, dental engine, amalgam, gold, wax and modeling compound.

An examination is required of all applicants and only holders of diplomas from reputable dental colleges are eligible to such examination.

The board does not interchange with other states, nor issue any temporary permits. For further information and application blanks, address

PETER APPEL, JR., *Secy.*,
P. O. Box 643, Cheyenne, Wyo.

North Dakota Board of Dental Examiners

The next regular meeting of the North Dakota State Dental Board of Dental Examiners will be held in the Armory at Fargo, N. Dak., beginning July 13th, 1915. All applications must be in the hands of the secretary by July 3d. For further particulars, write

F. A. BRICKER, *Secy.*,
Fargo, N. D.

South Carolina State Board of Dental Examiners

The next annual meeting of the South Carolina State Board of Dental Examiners will be held at Columbia, S. C., beginning at 9:00 A.M., Tuesday, June 15, 1915.

All applications must be in the hands of the secretary not later than June 5, 1915.

Application blanks and instructions for applicants may be obtained by addressing

R. L. SPENCER, *Secy.*,
Bennettsville, S. C.

Michigan State Board of Dental Examiners

The next regular meeting of the Michigan State Board of Dental Examiners for the examination of applicants who wish to practice dentistry in Michigan, will be held in the Dental College at Ann Arbor, beginning Monday, June 14, 1915, at 8:00 A.M., and continued through Saturday, June 19. For application blanks and full information apply to

A. W. HAIDLE, *Secy*, Negaunee, Mich.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

WHAT IS DOING IN THE SOCIETIES

Ohio—Ohio Valley

Athens, Ohio, April 15.—The semi-annual meeting of the Ohio Valley Dental Society yesterday was well attended, and the proceedings very interesting.

There were well known dentists from Chillicothe, Columbus, Dayton, Lancaster and nearer cities and towns and an active part in the varied proceedings was taken by a large number of them.

Dr. J. S. Basom, of this city, president of the society, conducted the meeting and Dr. W. S. Murray, also of Athens, was active in his duties as secretary and in other ways.

After routine business was disposed of, Dr. E. W. Martindale, of Columbus, read a paper on "Pressure Anesthesia," followed by discussion by C. W. Mills, Chillicothe; C. W. Outcalt, Lancaster; A. H. Gunther, Chillicothe; W. S. Murray, Athens; Dr. Haight, Cochocton; J. A. Lupton, Gallipolis; J. B. Hodge, Middleport; J. W. Brown, Albany.

By a unanimous vote Dr. J. R. Safford, Gallipolis, was made an honorary member of the society. In response he said it was nearly fifty years since he became an operative dentist and thanked the members for the honor conferred.

Dr. L. E. Custer, Dayton, read a paper on "A New Jacket Crown." A discussion followed which was taken part in by E. E. Hall and E. C. Mills, Columbus, who is president of the state dental society, and Doctor Martindale.

New members enrolled were H. L. Heck, Nelsonville; H. L. Ward, Middleport; T. C. Daniels, Middleport; L. E. Smith, Gallipolis; E. L. Neff, Nelsonville.

Officers elected by unanimous vote were: President, J. B. Hodge, Middleport; vice-president, C. M. Shoemaker, Pomeroy; secretary, R. B. Church, Pomeroy; treasurer, C. J. Zimmer, Pomeroy; members board of directors state society, J. A. Lupton, Gallipolis.

The next meeting of the society will probably be held in Pomeroy, October 13, 1915.

At 8:00 o'clock last evening the concluding feature of the day's program, a well appointed banquet at Hotel Berry, was held. Covers were laid for forty. Doctor Curtis, of Chillicothe, acted as toastmaster very acceptably. Dr. Edward C. Mills, the state president, warmly complimented the Ohio Valley Society on the success of the meeting and the growth of the society, which is now two years old.

Ohio—Toledo

At the annual meeting, May 14, the following officers were elected: President J. W. Travis; vice-president, T. S. Shaw; secretary, J. E. Sheffield; treasurer, G. E. Markley.

The new constitution, under which the local societies become components of the state and national organization, was adopted.

A committee was appointed to secure for Toledo the 1916 meeting of the Northern Ohio Society.

The local society now numbers some 65 members, and is prospering in every way.

Illinois—State

Peoria, Ill., May 15.—The fifty-first annual convention of the Illinois State Dental Association, excepting the Golden Jubilee meeting last year, the most successful in its history, closed here today with the election of officers. The election resulted as follows: President, J. P. Buckley, Chicago; vice-president, James R. Welch, Peoria; secretary, Henry L. Whipple, Quincy; executive council, L. L. Davis, Chicago; C. J. Sowles, Rockford, and T. A. Broadbent, Chicago. The next annual meeting will be held in Springfield.

The attendance was very large, reported at nearly 2,000.

Illinois—Chicago

Chicago, April 23.—F. B. Moorehead was chosen president of the Chicago Dental Society at its annual meeting at the Hotel La Salle yesterday, and with him these officers for 1915: Vice-president, R. J. Cruise; secretary, P. B. Idler; treasurer, R. E. MacBoyle; librarian, E. Coolidge. Directors: H. J. Tharp and T. E. Hawkins.

Wisconsin—Central

Wausau, Wis., April 16.—At the conclusion of one of the best and most interesting meetings ever held by the Central Wisconsin Dental Society, E. B. Owen was re-elected president of the association. W. I. McFarlane of Tomahawk, was re-elected secretary and treasurer.

One of the interesting papers of the sessions was read by Doctor Owen, whose subject was "Protesyn." J. R. Dodd, of Tomahawk, spoke on "Moss Fiber Gold Filling." A banquet was one of the pleasing features.

Minnesota—Minneapolis

Minneapolis, April 30.—Walter M. MacNeil was last night elected president of the Minneapolis District Dental Society at a meeting held in the Donaldson building. Other officers elected were: William Card, vice-president; Harry Nelson, secretary, and D. H. Carpenter, treasurer. The last two were re-elected.

Minnesota—St. Paul

St. Paul, May 1.—Plans were made last night at a meeting of the St. Paul District Dental Society for lectures to be given in the public schools on the care of the teeth.

G. B. Steadman was elected president; M. E. Ernst, secretary; J. W. O'Neil, treasurer. A paper was read by Dr. J. F. Shellman. Arrangements for the series of lectures will be completed soon.

Minnesota—Southeastern

Rochester, Minn., April 22.—Morning and afternoon sessions and a banquet in the evening were features of the dental clinic held here yesterday. The officers are: President, Doctor Herrick, of Red Wing; vice-president, Doctor Thorson, Rochester; treasurer, Doctor Cox, Faribault; chairman of executive committee, A. C. Fawcett, Rochester.

West Virginia—State

Wheeling, W. Va., April 17.—The annual convention of the West Virginia Dental Society, which has been in session at the Windsor Hotel since Wednesday, was brought to a close at noon yesterday, and it was the closing of the most successful convention which has been held by the dentists. They were highly pleased with their visit in the city and were very grateful in their praise for the many courtesies shown them during their stay. The next meeting will be held in Parkersburg, and it is likely that all future conventions will be held in Charleston, W. Va., it being selected in a contest with Clarksburg.

The morning session was taken up with the installation of officers, and the arranging of the business in preparation of closing the session. A paper on the subject of "Pyorrhea and Its Modern Treatment" was read by Dr. F. E. Stewart, of Philadelphia. The discussion was taken up by H. L. Satterfield, of Fairmont, W. E. H. Caldwell, of this city, and R. M. Temple, of Columbus, Ohio. This was followed by the report of the various committees and miscellaneous business. The session then adjourned. The new dental law passed by the last legislature and introduced by Delegate Clark, becomes effective within the next thirty days. The new bill forbids the declaration by a dentist that he practices painless dentistry unless there is really not the least pain to the patient.

Virginia—Tidewater

Norfolk, Va., May 14.—The regular monthly meeting of the Virginia Tidewater Dental Association was held last night in the Medical hall of the Taylor building. Matters of interest to the dental profession were discussed, and the election of officers for the ensuing year was held, with the following result:

C. B. Gifford, president; E. S. Webster, vice-president; Walter E. Miller, secretary, re-elected; Roland H. Walker, treasurer.

Virginia—State

Winchester, Va., May 8.—Members of the dental profession from all sections of the Virginia Valley attended the semi-annual meeting of their association in Staunton a day or two ago, at which twelve new members were admitted. Dr. W. B. Fahrney, of Timberville, was elected president, succeeding Dr. Hume Sprinkel, of Staunton. It was decided to hold the next meeting in Woodstock early in October. Papers and discussions will appear in later numbers of THE DENTAL SUMMARY.

North Dakota—State

Grand Forks, N. D., May 14.—The next annual meeting of the North Dakota Dental Association will be held in Grand Forks as a result of the decision at the annual meeting just brought to a close at Fargo.

A. M. Hardaway, of Minot, was elected president; L. Eckman, of Grand Forks, re-elected vice-president; R. S. Brown, of Bismarck, secretary, and W. V. Falls, of Omemee, treasurer.

Ohio State University will graduate 22 dental students this month.

Mississippi—State

Jackson, Miss., April 20.—The fortieth annual session of the Mississippi Dental Association was assembled today at the Liberal Arts building on the state fair grounds, and will hold three days. The officers of the association are L. B. Price, of Corinth, president; P. M. Fugler, of McComb, first vice-president; E. A. May, of Jackson, second vice-president; M. B. Varnado, Osyka, secretary; W. H. Reaben, McComb, journalist; C. B. Baker, Amory, treasurer.

The first day was devoted largely to hearing reports of committees, reading of communications and discussions of same. Tonight there was an enjoyable lantern lecture of "Alveo-Dental Pyorrhea," by Dr. C. C. Bass, of Tulane University, New Orleans; another lantern lecture by Dr. M. F. Wilson, of New Orleans, his subject being "Vaccines and Serums in Riggs' Disease."

Arkansas—State

Little Rock, Ark., May 16.—Dr. Elbert Stewart, of Little Rock, was selected president of the Arkansas State Dental Association at the annual election held during the closing session at the Hotel Marion yesterday. Dr. William B. Dormon, of Nashville, secretary, was given a vote of thanks for his efficiency and was elected secretary and treasurer after the two offices had been consolidated. Other officers elected were: E. A. Payne, of McGehee, first vice-president; G. C. Jernigan, of Rector, second vice-president; C. C. Roberts, of Morrilton, corresponding secretary. Members elected to the executive committee are as follows: Southwest district, W. S. Richardson, of Malvern; southeast district, Earl J. Loeb, of Arkansas City; central district, John E. Taylor, of Little Rock; northwest district, L. K. Charles, of Eureka Springs; northeast district, L. S. Johnson, of Jonesboro.

The following were recommended for appointment to the State Board of Dental Examiners: Southwest district, C. M. Gore, of McQueen; southeast district, J. W. Stevens, of Pine Bluff; central district, J. D. Jordan, of Little Rock; northwest district, I. M. Sternberg, of Fort Smith; northeast district, H. J. Green, of Paragould. Doctor Stevens was elected president of the board and Doctor Sternberg, secretary.

Inspection in Kansas

Topeka, Kans., April 16.—House bill 643 authorizes cities of more than 40,000 inhabitants to provide free dental examination for the children of the public schools, and for such dental work as may be found necessary.

DEATHS

At Baltimore, Md., May 12, Dr. Edward C. Kirby, complication; aged 56.

The body of Dr. Ira D. Steele, of Chicago, was found in the woods near Muskegon, Mich., May 8. Death was caused by valvular heart disease, while Doctor Steele was alone on a fishing trip.

At McKeesport, Pa., April 29, Dr. E. O. Seifert, aged 36.

At Portland, Ore., April 17, Dr. E. E. Newcomb, formerly of Cascade, Ia., aged 69. Doctor Newcomb was a pioneer Iowa dentist, where he practiced for many years.

At Indianapolis, Ind., April 22, Dr. J. W. Toye, of Marion, Ind., was killed by the collision of his auto with another.

Free Treatment in Indianapolis

Indianapolis, April 21.—The city board of health closed a contract with the Indiana Dental College yesterday whereby all public school children whose parents are poor will be given free dental treatment. The work will be carried on through the school nurses, who will take the children to the clinic and see that they receive proper attention. It is the health board's opinion that within a short time every pupil in Indianapolis will be free from the oral troubles that are recognized as a handicap to good work in school.

Dental Clinics Success

Janesville, Wis., April 22.—Free dental clinics in the Janesville public schools have been so successful they will be continued during the coming year. Local dentists are co-operating in the work.

Four-Year Course at O. S. U.

Columbus, O., April 16.—The curriculum for a four-year course in the College of Dentistry at the Ohio State University, which the university faculty has sanctioned to replace the present three-year course in 1916 or 1917, is nearing completion in tentative form and will be presented to the university board of trustees soon, according to Dr. Harry M. Seamans, dean of the College of Dentistry.

The new Pennsylvania dental law, providing a four-year course in colleges after 1921, requiring state license based upon such a course, and prohibiting fraudulent advertising, was signed by Gov. Brumbaugh, May 3d.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV JULY, 1915 No. 7

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

Editorial Office: 195 16th Avenue, Columbus, Ohio
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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REGULAR CONTRIBUTIONS

THE AMOEBA

BY EUGENE S. TALBOT, CHICAGO

NO SUBJECT HAS CAUSED such wide-spread discussion, in relation to diseases of the body in so short a time as that of the Amoeba. Thanks to the spirit of investigation, which has permeated medical science, this interest will continue until we have discovered its true place in the etiology, pathology and treatment of disease. The amoeba has been found in nearly every part of the body. What position it occupies and what relation it has to disease is yet to be determined. The object of this paper is to place on record what little is known of the nature of this germ and what has been done so far in connecting it with diseases of the body.

This germ is most interesting from the fact that it is known to scientists as the lowest form of animal life. From the unicellular animal we begin the study of both Phylogeny and Ontogeny. This germ or unicellular animal is of the Rhizopoda type, and is found in ponds and streams, in temperate and cold regions in warm weather. It is more commonly found in sluggish streams and stagnant water in the tropics. It is possible that these germs may be found in most, ifn ot all, the drinking water used in all countries to a greater or less extent, if they are the cause of disease. This statement is based upon the fact that these germs are supposed to be found somewhere in the body of people in all climates. This germ is also found upon green vegetables and especially those used for salads and those eaten uncooked. These vegetables are taken from gardens fertilized by human excreta. This was beautifully illustrated when a large percentage of first-cabin passengers, landing at Naples in June, 1912, came down with amoebic dysentery in two weeks after landing. A few of the tourists were so ill that they were obliged to abandon their journey. Most of them, however, after a few days' treatment were able to continue their summer outing. My family and I escaped for the reason that we had previously learned not to eat fresh uncooked vegetables in tropical countries.

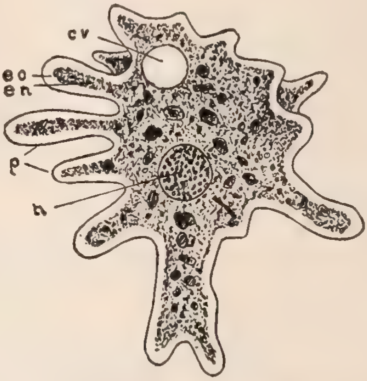

Fig. 1. Amœba proteus: n, nucleus; c v, contractile vesicle; e c, ectoplasm; e n, endoplasm; p, pseudopodia.

DESCRIPTION OF CELLS

The following description of the amoeba is taken from my work "Developmental Pathology; A Study in Degenerative Evolution." Independent activity in a unicellular organism is well illustrated by the amoeba (Fig. 1), a creature representative of the simplest form of animal life. It is composed solely of naked protoplasm. Its outer, firmer and transparent portion is known as the ectoplasm (ec), while the inner (which is granular and more fluid) is called endoplasm (en). As the animal changes its shape, these inner particles or endoplasm move and graduate, without apparent union, into the ectoplasm.

On the outer edge of the endoplasm and attached to the inner surface of the ectoplasm, a nucleus (n) can be more or less distinctly seen. It has the appearance of a bladder-like cavity surrounding a globular nucleolus.

A contractile vacuole (cv), it is also located in the endoplasm. The animal thrusts out projections called pseudopodia or false feet, which sometimes consist of ectoplasm, but oftentimes the endoplasm is extended into it so that granules can be seen moving from the center into the false feet and vice versa. In this manner, the animal's locomotion is performed as a sort of creeping. Thus the amœba finds those other one-celled Desmids and Diatoms upon which it feeds. The amœba approaches its food, and, by means of its pseudopodial movement, flows around and encloses its prey within its protoplasm, where assimilation takes place. The indigestible portions are then cast off. No apparent break can be found in the ectoplasm after the animal has forced its prey through it. This action is analogous to that of the leucocytes in destroying the poisons in the blood.

When resting it is nearly round, but in motion it is flat upon one side, while the other is extended. There is no egg-stage. Reproduction is accomplished by mitosis (Fig.2), hence a new amœba is like the full grown parent, except as to size.

REPRODUCTION OF THE AMOEBA

I have shown that the amœba is the simplest form of animal life. The manner of reproduction, however, may be simple or complex. Craig has shown that there are four methods, simple mitosis, schizogony, gemmation, and reproduction within the cyst. All species are capable of simple mitosis, as illustrated in Fig. 2. while the second, third and fourth methods depend upon environment for reproduction. The gemmation or budding process, however, seems to be confined to one variety of germ, the entamœba histolytica. Much however could be said about the different methods of reproduction and development, but it would extend the length of the paper beyond limits.

AMOEBA IN MAN[1]

The amœba was first found in man in his feces by Lambl of Prague, in 1860. He described the germ in the feces of a child suffering from diarrhoea but did not attach much importance to their presence at that time. In 1870 Lewis and Cunningham studied cholera patients in India, and found the amœba in the feces of 20 per cent. of cases. Loesch, of St. Petersburg, was the first to give an accurate description of the amœba in man in 1875. Grassi, in 1879, confirmed the findings of others but did not consider them the cause of dysentery, as he found them in both health and disease. Kartulis, made extensive investigations upon amebic dysentery in Egypt in 1886, of one hundred and fifty cases. Later he reported five hundred cases. Those reports are the most complete and scientific that have been made up to date, and establish etiologic relationship between the amœba and certain forms of dysentery. Although these researches were most complete, Craig says that the researches of this author attracted but little attention in

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[1] Much of the history is taken from the Parasitic Amoeba of man, by Charles F. Craig, M.D.

Europe, America or the tropics. After the publication of Kartulis' work, Hlava of Prague confirmed this work by finding the amœba in sixty cases of disease. He was able to produce the disease in dogs and cats by injecting feces containing amœba into the rectum.

The first investigator in America to observe amœba in dysentery was Osler, in 1890. In the same year Musser and Stengel and in 1891 Dock confirmed these findings. Between this date and 1911 over one hundred thirty different authors have written upon this subject. Probably after that period, at the present time as many more have investigated and recorded their views. Most of the research work has been done abroad. Very little was known of this germ in connection with disease in this country until 1901. Since this period many investigators have been at work in America.

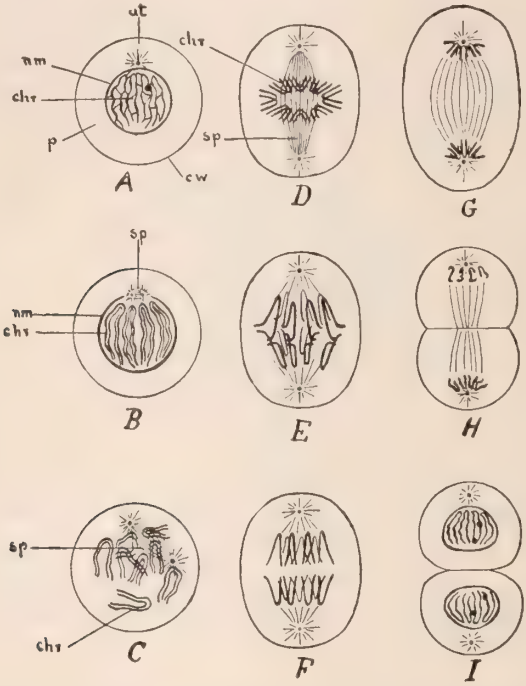

Fig. 2. Diagram illustrating Mitosis. A, the cell commencing activity; B, C, D, phases in the formation of the spindle and the chromatin loops or V's, also showing that the mother V's have split into daughter V's; D, the chromatin loops forming the equatorial plate, chr; E, F, G, separation of the daughter loops (daughter chromosomes) and their passage towards the poles of the spindle, thus forming daughter nuclei; H, I, division of the protoplasm so as to form two daughter cells; at, attraction sphere enclosing a centrosome; n m, nuclear membrane; chr, chromatin threads; p, protoplasm; c w, cell wall; sp, spindle.

For a general discussion of this subject the amœba may be divided into two groups. First, those found in water and may be called "free living" and which are harmless, and second which have a "parasitic existence" living in animals, including man. So little is known of the parasitic variety of the amœba at this time that it is difficult to state where or when the harmless variety ends, and the pathogenic begins.

While Loesch was the first to show the amœba in typical dysentery it remained for Schaudinn in 1903 to clearly show that in the intestines of man at least two species of amœbæ, differing in methods of reproduction, morphology and cycle of life, are found—one a harmless germ living with others of the same nature occurring in both health and disease; the other pathogenic causing one form of dysentery. He was able to follow the cycle of both germs by experiments upon himself. The one causing no inconvenience while the other produced one form of dysentery. He obtained two attacks of the disease but four years later died from an abscess of the sigmoid flexure. From these experiments he named the harmless amoeba "Entamœba Coli," the one producing dysentery "Entamœba histolytica." Since the work of Schaudinn other investigators have studied the habit of the parasitic amœba and have divided it into still other species. According to Musgrave and Clegg, however, at the present time the classification of Schaudinn has been accepted by most scientists.

Examinations of the stools of healthy people living in different parts of Europe, Philippine Islands and in America, show that an average of over 50% have the "Entamœba Coli." Patients kept under observation have been known to have the amœba in the intestines from four to six years without a trace of dysentery. Again, diseases of the intestines, other than dysentery, such as acute and chronic diarrhoea, acute and chronic gastritis, typhoid fever, cholera, often have the "parasitic amœba," without the local results mentioned above.

Koch examined five autopsy cases of dysentery in Egypt and found that two had abscesses in the liver. He found the parasitic in the capillaries near the abscess walls and concluded that the amœba bore some etiologic relations to the disease. Kartulis found in five hundred cases coming to autopsy fifty-five per cent. of amœbic abscesses of the liver. Zancarol found amœbic abscesses in fifty-nine per cent. of four hundred forty-four cases. Smith in forty-five autopsies of amœbic dysentery found abscesses in the liver in eighty-four and four tenths per cent. There is a large amount of data on this subject, but enough cases have been quoted to show that the liver is a frequent locality for the accumulation of parasitic amœba.

Parasitic amœbæ have also been found in abscesses in the brains, lungs and kidneys. They have also been found in the genito-urinary tract—supposed to have reached this locality through fistulæ between the bladder and the intestines. Flexner in 1892 found the parasitic amœba in the pus of an abscess in the oral cavity, and Kartulis in 1893 in an abscess of the lower jaw. It will be seen therefore, that the entamœbæ histolytica are found in connection with pus infection in all parts of the body. Different investigators have suggested a separate name for each locality where the amœba has been found. Such as entamœba buccalis, entamœba miurai, entamœba pulmonalis, etc. Later, however, investigators are of the opinion that no matter where these parasitics are found, they all resemble the entamœba coli or the entamœba histolytica so closely in appearance that these names answer the purpose, at least for the present, and they cannot be considered distinct and separate species.

In reviewing what has been accomplished by researchers, there are two forms of parasitic entamœba in the body: Entamœba Coli, and entamœba histolytica. Further researches may develop other varieties. The entamœba coli seems to be harmless while the entamœba histolytica seems to cause diseases and abscesses to form in different parts of the body. It will be observed that these germs are found in connection with pus surfaces and pus cavities in different parts of the body.

AMOEBAE IN THE MOUTH

Miller[1] states that deBary has designated a group of lowest organisms, whose proper position in the natural world is still a subject of dispute, and which consequently, have at present been assigned a place outside of, or between, the animal and vegetable kingdoms. They are according to deBary's conception, more nearly related to the simplest animal organisms (the amœba) than to the fungi. They have been found in all parts of the mouth, teeth, throat and tonsils. The species, however, are not described. Prowazek, in 1904, Grassi and Gros all found the amœba in the mouth, giving different names such as, "endamœba buccalis," "amœba dentalis" and "amœba gingivalis." None of these men considered the germ of much importance.

Not until Dr. M. T. Barrett, of Philadelphia, read his paper on "The Protozoa of the Mouth in Relation to Pyorrhea Alveolaris" before the Pennsylvania State Dental Society at Philadelphia, July 1, 1914, was there any attention given to this particular germ in the mouth. He believed it to be a pathogenic germ and that it caused so-called "Pyorrhea Alveolaris."

On July 31, 1914, Dr. Angelo Chiavaro of Rome, Italy, read a paper before the American Dental Society of Europe at Paris, in which he stated that he found the germ in every one of twenty-two cases of pyorrhea and fourteen other cases not pyorrhea out of a total of sixty-eight examinations. He concluded that the endamœba has no pathogenic action; on the contrary, as it feeds on bacteria, it is most probably an adjuvant in the auto-disinfection of the mouth. It is found in pus of all cases of pyorrhea alveolaris. Barrett examined the material in 87 cases of pyorrhea and has found amœbæ in 85 of them. Since these papers were written many others have done research work on the pus from about the teeth with similar results. Much work is yet to be done on the diseases of the teeth and other parts of the mouth, although the amœba is found in these localities.

From 1890 to 1896 the author published in different medical and dental journals his researches on "The Peridental Membrane and Dental Pulp." In those papers he gave the results of many years' research, showing peridental abscesses upon the roots of teeth situated at different localities. This work was the first microscopical work actually demonstrating the formation and development of peridental abscesses. At the same time his studies of the dental pulp also revealed abscesses situated at different localities from the apical end to and including the horns of the pulp. He was particularly surprised at the frequency of the abscesses, both in the pulp and peridental membrane, which apparently produced little or no pain to the patient. One pulp specimen showed (a) an abscess just forming, (b) one fully developed, (c) scar tissue of a healed abscess. Is it possible that the entamœba histolytica can be the cause or assist in any way the production of these abscesses?

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[1] Micro-Organism of the mouth. 1890. PP. 351.

In the light of what has been accomplished by research of the amœba in relation to disease in other parts of the body, it is now up to the dental profession to study varieties, nature, habitat of the germs as found in the mouth. If they originate from drinking water and from green uncooked vegetables, evidently they reach the body through the mouth, and it seems reasonable to suppose that their appearance in the mouth would be the proper place to study them.

In preparing this paper some thoughts have occurred to me which are worthy of expression here. Botanists and zoologists tell us that the amœba is found in warm climates, in sluggish streams and ponds. That it lives upon fresh water algæ. If this amœba is the cause of so-called pyorrhea, since all people in all parts of the world have it to a greater or less extent, then such sources of pure drinking water as obtained in the mountains of Austria and used in Vienna, in the hills of Italy and used in Rome, the cold waters of the great lakes used in Milwaukee and Chicago, must also contain the amœba. Is this the case? Does the amœba found about the teeth come from drinking water? Does the amœba found in the mouth come from green uncooked vegetables where human excreta is not used for fertilizing the ground? Are the amœbæ found in the mouth and in the pus about the teeth "entamœba coli" or "entamœba histolytica" or both, or are they an entirely different species? Are not the amœbæ taken into the mouth in drinking water perfectly harmless? Cannot these amœbæ be mistaken for some one of the five leucocytes or other broken-down cells in the pus? I have known such a mistake to occur. Are the different free living varieties harmless before they reach the mouth, but contain poisonous substances which when in contact with the tissues of the body set up pathologic conditions? Are the free living varieties harmless until they reach the mouth, and then on account of environment or other causes undergo a pathologic change? Are they harmless parasites in themselves but carriers of poison from one part of the body to another and by so doing produce disease in different tissues of the body peculiar to their structure? Are there different varieties of amœbæ, one capable of producing disease in one organ and another amœba producing a different disease in another organ or tissue, or does the same amœba produce a different form of disease according to the locality? All of these questions must be answered before a clear conception of the position of the amœba in the body can be understood.

Does the amœba produce Interstitial Gingivitis, a disease which causes inflammation of the gums and alveolar process, causing absorption of bone, loosening of the teeth and eventually their exfoliation? To those who wish to study the amœba in its relation to disease, let me save you the trouble and effort by answering this one question, that it does not.

31 N. State St.

MODERN METHODS OF PRODUCING LOCAL ANESTHESIA*

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HISTORY

THE ELIMINATION OF PAIN during surgical operations is inseparably interwoven with the history of the human race. It has always been the aim of those interested in the cure of bodily ills to relieve pain in some empirical manner. The efforts to solve the riddle of painless operations were, however, seemingly so very futile that even as late as 1832 Velpeau was led to express his pessimism as follows: "To escape pain in surgical operations is a chimera, which we are not permitted to look for in our time." Little did he suspect that he stood at the very threshold of the discovery of anesthesia and that less than a decade later the "nirvana" of painless operations would be an accomplished fact. And when Dieffenbach, in 1847, wrote these classical words regarding the use of ether as an anesthetic, "the beautiful dream, to eliminate pain, has become a fact—pain, the highest consciousness of our earthly existence, its clearest conception of the imperfections of our body, it has to bow low before the powers of the human mind," the world at large awakened to the fact that pain had been conquered.

The discovery of anesthesia is essentially to be credited to the dental and medical profession of the United States, and the names of Crawford W. Long, Horace Wells, William P. G. Morton and Charles F. Jackson are inseparably connected with it. "If America has contributed nothing more to the stock of human happiness than anesthetics, the world would owe her an everlasting debt of gratitude," said the late Samuel D. Gross, the eminent surgeon, who had ample opportunity to observe in his own operating room the most remarkable changes that followed the introduction of anesthetics.

From an historical viewpoint, comparatively few important methods for the purpose of locally obtunding pain are to be recorded prior to the introduction of cocain. The impression of nerve trunks for the abolition of pain seems to be of an old and unknown origin, which was revived by Guy du Chauliac and Ambroise Pare, and finally found a permanent place in surgery as the Esmarch elastic bandage. Physically reducing the temperature of a part of the body by the application of cold was instituted much later. Bartholin and Severino introduced this method in the middle of the sixteenth century. It became a lost art, however, until John Hunter, of London, again called attention to its benefits by demonstrating it upon animals, and Larray, the chief surgeon of Napoleon's army, employed it for amputating purposes (1807). James Arnott, in 1849, utilized a freezing mixture, consisting of ice and salt, as a means of producing local anesthesia.

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*Read before the Michigan State Dental Association, 1915.

Through the efforts of Sir B. W. Richardson, in 1866, it was placed on a rational basis by the introduction of the ether spray. The various narcotics which were employed for internal purposes were also made use of as local applications. Mandragora, henbane, aconite, the juice of the poppy head, and many other analgesic drugs enjoyed a world-wide reputation. There is probably no other medicinal plant around which clusters more mysterious and quaint associations than mandragora. It should be remembered, however, that mandrake, or mandragora (atropa mandragora), must not be confounded with American mandrake, or May apple (podophyllum peltatum), to which it bears no relation.

The empirical search for new methods and means pressed the mysticism of the electric current into service, opening a prolific field to the charlatan, which even to this day has not lost its charm. Richardson's voltaic narcotism for a time attracted the attention of the medical and dental profession. Its inventor claimed "that by the action of a galvanic current, passing through a narcotic solution, held in contact with the part to be operated upon, some of the narcotic substance passed much more rapidly into the tissue, and that in many instances complete local anesthesia was in this way produced by solutions which are entirely inert when applied, even to the most delicate tissue, without the galvanic current." This very same principle, discovered by Reuss in 1807, and introduced by him as "electric endosmosis", or as "cataphoresis", by E. du Bois-Raymond, was "newly discovered" and reintroduced into dentistry about a decade ago. In cyclonic fashion it swept over the globe, but today it is almost forgotten.

Electric or galvanic anesthesia was suggested as far back as 1851 by Dr. A. Hill, of Connecticut. Francis, in 1858, recommended the attachment of the electric current to the well-insulated handles of the forceps for the painless extraction of the teeth, and, as dental depots still offer appliances of this nature for sale, it seems that this method is still in vogue with some operators. According to Regner and Didsbury, as cited by Sauvez, a current of electricity of high frequency, when directed toward the long axis of a tooth for a shorter or longer period previous to its extraction produces insensibility to pain. In 1880 Bonwill suggested his method of "rapid breathing as a pain obtunder," which he claimed "produces a similar effect to that of ether, chloroform and nitrous oxid gas in their primary stages."

In the early days of modern dentistry many feeble efforts were made to alleviate pain during trying operations. Chloroform, alcohol, ether, aconite, opium, the essential oils, and many other drugs were the usual means that were employed, either separately or as compounds, usually under fanciful names, for such purposes. Snape's calorific fluid, composed of chloroform, tincture of lemon balm, and oil of cloves; nabolis, consisting of a glycerid of tannic acid and a small quantity of chloral hydrate; Morton's letheon, which was sulphuric ether mixed with aromatic oils, are examples of proprietary preparations which enjoyed quite a reputation in their time. In 1853 Alexander Wood introduced a method of general medication by means of hypodermic injections, and a few years later the French surgeon Pravaz modified the old style syringe for this special purpose, which since is known as the "Pravaz" or hypodermic syringe. At once it was suggested to apply such drugs as morphine or tincture of opium for the purpose of producing local anesthesia. The results were not encouraging, however, until cocain was advocated. Cocain was discovered by Niemann in 1859, but it required twenty-five years to make known the remarkable anesthetic properties which this alkaloid possessed when applied in the ready soluble form of its hydrochloric salt. It was on September 15, 1884, that Carl Koller, of Vienna, presented this epoch-making communication at the Ophthalmologic Congress at Heidelberg, in which he demonstrated the effects of cocain as a local anesthetic. With the introduction of this drug into therapeutics, local anesthesia achieved results which were beyond expectations, and its final adoption created a new era in local anesthesia.

MEANS OF PRODUCING LOCAL ANESTHESIA

The term anesthesia (without sensation), which was suggested in 1846 by the great physician-literateur, Oliver Wendell Holmes, to Doctor Morton, is usually defined as an artificial deprivation of all sense of sensation, while the mere absence of pain is referred to as analgesia. Correctly speaking, the term local anesthesia is partially a misnomer. In producing local anesthesia we do not fully comply with all the requirements that anesthesia demands, because a part of the sensorium—the sense of touch, for instance—is not abolished. The term local anesthesia, has, however, acquired such universal recognition that it would seem unwise to recommend a change.

Anesthesia may be artificially produced by inhibiting the sensory nerve fibers at their central end-organs in the brain or at their peripheral end-organs in the tissues, thus producing general and local anesthesia. Local anesthesia may be obtained in two definite ways. We may inhibit the function of the peripheral nerves in a circumscribed area of tissue, and we refer to this process as "terminal anesthesia," while, if we block the conductivity of a sensory nerve trunk somewhere between the brain and the periphery, we speak of it as "conductive anesthesia." Conductive anesthesia may be produced by injecting into the nerve trunk proper—endoneural injection—or by injecting into the tissues surrounding a nerve trunk—perineurial injection. The latter form is the usual method pursued when conductive anesthesia for dental purposes is indicated. Specific forms of local anesthesia may also be produced by paralyzing the sensory ganglia in the brain or in the spinal cord; these methods have, however, no bearing on the subject under consideration.

The successful practice of local anesthesia involves the carefully adjusted co-operation of a number of important details, each one constituting a definite factor in itself, which, when neglected, must necessarily result in failure. As a whole, the practice of local anesthesia by the hypodermic method represents the composite of the following factors:

1. A solution of active ingredients corresponding to the physical and physiologic laws which govern certain functions of the living cell.
2. A carefully selected hypodermic armamentarium.
3. A complete mastery of the technic.
4. A proper selection of the correct method suitable for the case in hand.
5. Good judgment of prevailing conditions.

PHYSIOLOGIC ACTION OF ANESTHETICS

According to more recent therapeutic conceptions, it is generally recognized that a drug or combination of drugs which simultaneuosly produce local anemia and inhibition of the sensory nerves in a circumscribed area of tissue is the logical solution of the question of local anesthesia. Certain important factors, however, relative to the physiologic and physical action of the solution employed for hypodermic injection upon the cell govern the successful application of such methods. It is of prime importance, therefore, to comply with the laws regulating the absorption of injection solutions—osmotic pressure.

If we separate two solutions of salt of different concentration by a permeable animal membrane, a continuous current of salt and water results, which ceases only after equalization of the density of the two liquids—that is, equal osmotic pressure (according to the Boyle-Van Hoff law) is established. The current passes in both directions, drawing salt from the stronger to the weaker solution, and water vice versa, until osmotic equilibrium is obtained. The resultant solutions are termed, according to De Vries, isotonic.

Osmotic pressure is a physical phenomenon possessed by water and all aqueous solutions, and is dependent on the number of molecules of salt present in the solution and on their power of dissociation. In organized nature these osmotic interchanges play an important role in regulating the tissue fluids of both animals and plants. In the animal tissue the circulation depends principally upon the mechanical force exerted by the heart. The life of the cell depends on the continuous passage of these fluids, which furnish the nutrient materials, consisting of water, salt and albumen. These chemicals are normally present in certain definite proportions. The membrane of the living cell is, however, only semi-permeable—that is, the cell readily absorbs distilled water when surrounded by it. ·The cell becomes macerated, loses its normal structure, and finally dies. If on the other hand, the surrounding fluid be a highly concentrated salt solution, the solution absorbs water from the cell; no salt molecules enter into the cell body proper. The cell shrinks, and finally dies. This process of cell death is in general pathology referred to as necrobiosis.

Another important factor teaches that all aqueous solutions that are isotonic possess the same freezing point—that is, all solutions possessing an equal freezing point are equi-molecular, and possess equal osmotic pressure. This law of physical chemistry has materially simplified the preparation of such solutions. The freezing point of human blood, lymph, serum, etc., has been found to equal approximately 0.55 degrees C., which in turn corresponds to a 0.9 per cent. sodium chloride solution. Such a solution is termed a physiologic salt solution. In the older works on physiology a 0.6 per cent. sodium chloride solution is referred to as a physiologic salt solution, and corresponds to the density of the blood of the frog. A slight deviation above and below the normal percentage of the solid constituents is permissible. When physiologic salt solution at body temperature is injected into the loose connective tissues under the skin in moderate quantities, neither swelling nor shrinking of the cell occurs. A simple wheal is formed, which soon disappears, and as no irritation results, consequently no appreciable pain is felt. Other similar bodies that are equally soluble in water act in the same manner, with the exception of the salts of the alkali and alkaline earth metals—as potassium or sodium bromid. The latter substances produce intense physical irritation, followed, however, by prolonged anesthesia, and in consequence are termed by Liebreich painful anesthetics.

If, on the other hand, simple distilled water is injected, only a superficial anesthesia is produced; the injection itself is very painful, and acts as a direct protoplasm poison by maceration of the cell contents, which results in the death of the cell. If distilled water approximately at a ratio of ten drams to the pound of body weight is injected into dogs, they will succumb in a short time. The injection of higher concentrated salt solutions produces opposite effects; water is removed from the tissues with more or less pronounced pain, and followed by superficial anesthesia. The red blood corpuscles are extremely susceptible to any injected fluid which is not isotonic in its nature. They are universally destroyed (hemolysis)by the injection of fluids which are not represented by an isotonic salt solution. Severe tissue disturbances result, which may terminate in gangrene.

Hypotonic solutions— solutions containing less than 0.9 per cent. of sodium chlorid—cause swelling of the tissue, while hypertonic solutions—solutions containing more then 0.9 per cent. of sodium chlorid—produce shrinkage. These manifestations are proportionately the more intense the further the solution is removed from the freezing point of the blood. Furthermore, hypotonic as well as hypertonic solutions require much more time for their absorption than isotonic solutions, as the osmotic pressure has to be standardized to the surrounding fluids—that is, to the isotonic index of the tissue fluids. Local anemia, or ischemia— a temporary constriction of circulation—prevents, as it has been experimentally shown, the rapid absorption of fluids that are injected into the affected area. Retarded absorption of the injected fluid, holding poisonous drugs in solution, means increased action of these poisonous drugs within the injected area. Increased action denotes increased consumption of the poisonous drugs, and, as a consequence, there is less danger from general absorption. The more important means applied for the purpose of producing local anemia are:

1. The Esmarch elastic bandage.
2. The application of cold.
3. The extract of the suprarenal capsule, or its synthetic substitutes.

Some observers have maintained that local anemia produces anesthesia. This is not, however, the case, as it is merely an important means to confine the injected anesthetic to the anemic region, and thus bring about an increased and prolonged action of the drug. Consequently the concentration of the anesthetic solution may be of a lower percentage, which, of course, lessens the danger of intoxication. For plausible reasons the Esmarch elastic bandage cannot be made use of for dental operations.

Physically reducing the temperature of the body by the application of cold (ice pack, ice and salt mixture, cold metals, etc.) was practiced by the older surgeons. James Arnott, in 1848, suggested the adoption of diminished temperature as "a safer mode than any hitherto in use of producing insensibility in surgical operations," and Blundell, in 1855, advocated ice packs and salt solutions as means of producing "local anesthesia by congelation" for dental purposes. Through the efforts of Sir B. W. Richardson, in 1866, this method was placed on a rational basis by the introduction of his ether spray. To obtain good results, a pure ether (boiling point 95 C.), free from water, is necessary. Certain other hydrocarbons possess similar properties in varying degrees, depending on their individual boiling point.

In 1867 Rottenstein called attention to the use of ethyl chlorid as a refrigerating agent, and Rhein, in 1889, introduced methyl chlorid for the same purpose. In 1891 Redard reintroduced ethyl chlorid as a local anesthetic, which since has become known by many trade names as antidolorine, kelene, narcotile, etc.—and mixtures of the first two in various proportions, known as anestol, anestile, coryl, methethyl, etc., are extensively used in minor oral and general surgery. A pure ethyl chlorid (boiling point 55 F., 13 C.) is best suited for this purpose, as it lowers the temperature of the tissues sufficiently to produce a short superficial anesthesia in a few minutes. Too rapid cooling or prolonged freezing by methylchloride (boiling point 12 F., 24 C.), or the various mixtures thereof, produce deeper anesthesia, but such procedures are dangerous. They frequently cut off circulation in the affected parts so completely as to produce sloughing (necrosis). Liquid nitrous oxid gas, liquid or solid carbonic acid (recently known as carbonic acid snow),and liquid air, all of which have a boiling point far below zero, are recommended for similar purposes, but they require cumbersome apparatus and are extremely dangerous.

ETHYL CHLORID AND ITS ADMINISTRATION

Ethyl chlorid—Monochlorethane; hydrochloric ether, C_2H_5Cl. "A haloid derivative, prepared by the action of hydrochloric acid, an absolute alcohol." At normal temperature, ethyl chlorid is a gas, and under a pressure of two atmospheres it condenses to a colorless, mobile, very volatile liquid, having a characteristic, rather agreeable, odor and burning taste. It boils at about 55 F. (13 C.) and is very inflammable, burning with a smoky, green-edged flame. It is stored in sealed glass or metal tubes, and when liberated at ordinary room temperature 70 F., (21 C) it evaporates at once. In commerce it is supplied in plain or graduated glass tubes of from 3 to 60 grams capacity, or stored in metallic cylinders holding from 60 to 100 grams or more. To remove the ethyl chlorid from the hermetically sealed smaller tubes, the neck has to be broken off, while the larger glass and metallic tubes are provided with suitable stopper corks of various designs to allow definite amounts of the liquid to be released.

MODE OF APPLICATION

For the extraction of teeth, immediate removal of the pulp, opening of abscesses, and other minor operations about the oral cavity, the tube should be warmed to body temperature, by placing it in heated water, and its capillary end should be held about six to ten inches from the field of operations. The distance depends on the size of the orifice of the nozzle, and complete vaporization should always be produced. The Gebauer tube is fitted with a spray nozzle, which shortens the distance to one or two inches, and is especially well adapted for dental purposes. The stream is directed upon the tissues until the latter are covered with ice crystals and have turned white. For the extraction of teeth the liquid should be projected directly upon the surface of the gum as near the apex of the root as possible, but care should be taken to protect the crown of the tooth on account of the painful action of cold on this part. Tissues to be anesthetized should first be dried and well surrounded by a film of vaseline or glycerine, and protected by cotton rolls and napkins, to prevent the liquid from running into the throat. Let the patient breathe through the nose. Occasionally light forms of general anesthesia are induced by inhaling vapor. On account of the difficulty of directing the stream of ethyl chlorid upon the tissues in the posterior part of the mouth, it is not successfully applied in those regions. The intense pain produced by the extreme cold prohibits its use in pulpitis and acute pericementitis. To anesthetize the second and third branch of the fifth nerve, it is recommended to direct the stream of ethyl chlorid upon the cheek in front of the tragus of the ear, but the author has not seen good results from such a procedure. Caution should be exercised in using ethyl chlorid near an open flame or in conjunction with the thermocautery, as severe burns have resulted by setting the inflammable vapor on fire.

Within the last decade the active principle of the suprarenal capsule has evoked extensive comments in therapeutic literature. It has been isolated by a number of investigators under different names, as epinephrin by Abel (1897), suprarenin by Feurth (1898), and adrenalin by Takamine and Aldrich (1901). Many other titles are given to this chemical—as adnephrin, adrin, paranephrin, suprarenalin, supracapsulin, hemostasin, etc. The United States Pharmacopoeia (eighth revision) has not as yet admitted this alkaloid to its pages, and, therefore, whenever we refer here to the hydrochloric salt of the alkaloid of the suprarenal capsule, we speak of it as adrenalin, the term which is at present preferred in the United States. Adrenalin is a grayish-white powder, slightly alkaline in reaction, and perfectly stable in dry form. It is sparingly soluble in cold and more soluble in hot water, is insoluble in ether or alcohol, and with acids it readily forms soluble salts. The preparation that is employed mostly for therapeutic purposes is a solution of adrenalin hydrochloride in a 1 to 1000 physiologic salt solution, to which preservatives—as small quantities of chloretone, thymol, etc.—are added. Adrenalin solution does not keep well. On exposure to air and especially in the presence of even minute quantities of an aklali it is easily oxidized, becoming pink, then red, and finally brown, and with this change of color its physiologic property is destroyed. If the adrenalin solution be further diluted, it becomes practically worthless within a few days.

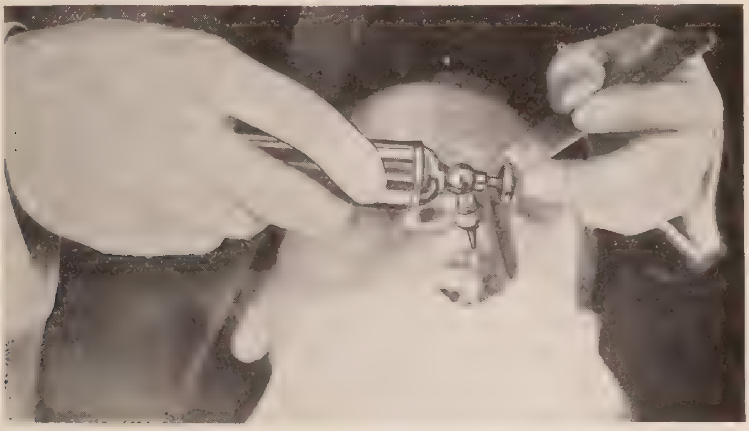

Fig. 1. Application of the ethyl chlorid spray.

When adrenalin is injected into the tissues, even in extremely small doses, it temporarily raises the arterial blood pressure, acting as a powerful vasoconstrictor by stimulating the smooth muscular coat of the blood vessels, and thus produces local anemia. Large doses finally reduce the blood pressure, and heart failure results. The respiration at first quickly increases, but slows down and finally stops with expiration. Its action is largely confined to the smooth muscle fibres of the peripheral vessels. Adrenalin is destroyed by the living tissue cells, the body ridding itself of the poison in some unknown manner. While adrenalin does not possess local anesthetic action, it increases very markedly the effect of certain anesthetics when combined with them. Very recently, it has been shown by Esch, that adrenalin possesses a specific action on nerve tissue, viz., it prepares the latter tissue in a peculiar way so as to take up the anesthetic more readily. Esch compares this action with the use of a mordant in the dyeing industry, viz., to "fix" the color. These observations are of vast importance, in connection with the production of local anesthesia. Carpenter, Peters, Moller, and others referred to the use of adrenalin in this respect, and finally Braun, in 1902, published his classic researches, and to him and his co-workers, especially Heinze and Lawen, belong the credit of establishing a rational basis for the production of local anesthesia. It is claimed that secondary hemorrhage frequently occurs after the anemia produced by the adrenalin has subsided, and that tissues themselves suffer from the poisoning effect of the drugs, resulting in necrosis. Such results are produced only by the injection of too large quantities of the drug, which by their deeper action close up the blood vessels, and, if the tissues are too long deprived of the circulation, we are able to understand why sloughing may result. Small doses of adrenalin have no effect upon the tissues or on the healing of a wound. Palpitation of the heart and muscular tremor, which were occasionally noticed in the early period of the use of the drug, are the direct result of too large doses.

Recently a synthetic adrenalin has been successfully prepared by Stolz, which, with hydrochloric acid, forms a stable and readily soluble salt. It is known as synthetic suprarenin hydrochloride. The new chemical has been carefully tested physiologically and in clinical work, and the general consensus of opinion points to the fact that it is not alone equal, but in certain respects superior, to the organo-preparations. Synthetic suprarenin solutions may be readily sterilized by boiling. They are relatively stable, and their chemic purity insures uniform results. They are comparatively free from dangerous side actions. The writer's observations regarding the value of synthetic suprarenin relative to its actions and its general behavior is in full accordance with the above statements, and its advantages over the organo-preparations has led us to adapt it as a component in the preparation of local anesthetic solutions. For dental purposes—that is, for injecting into the gum tissue—the dose may be limited to one drop of the adrenalin solution (1 to 1000) or the synthetic suprarenin solution (1 to 1000), added to each cubic centimeter of the anesthetic solution, five drops being approximately the maximum dose to be injected at one time.

Ever since the introduction of cocain into materia medica for the purpose of producing local anesthesia, quite a number of substitutes have been placed before the profession, for which superiority in one respect or another is claimed over the original cocain. The more prominent members of this group are tropacocaine, the eucaines, acoin, nirvanin, alypin, stovaine, novocain, and very recently, quinin and urea hydrochlorid. None of these compounds, with the exception of novocain, has proved satisfactory for the purpose in view. The classical researches of Braun have established certain factors which are imperative to the value of a local anesthetic. These factors concern their relationship to the tissues in regard to their toxicity, irritation, solubility and penetration, and to the toleration of adrenalin.

There is no need at this moment to enter into a discussion of the pharmacologic action of the drugs usually classified as local anesthetics. Let it suffice to state how the above mentioned drugs fulfill the demands of Braun. Tropacocain is less poisonous, but also less active than cocain, it completely destroys the action of adrenalin; the eucaines partially destroy the adrenalin action, they are, comparatively speaking, equally as poisonous as cocain; acoin is irritating to the tissues and more poisonous than cocain; nirvanin possesses little anesthetic value; alypin and stovaine are closely related, producing severe pain when injected, which occasionally has resulted in necrosis. Quinin and urea hydrochlorid reacts strongly acid and, as a consequence, severely damages the tissues in the injection area. As we have recently shown elsewhere it possesses no advantage when employed as a local anesthetic in dental operations but has many disadvantages as compared to cocain or novocain.

Novocain alone fully corresponds to every one of the above claims. Its toxicity is about two to six times less than cocain; it does not irritate in the slightest degree when injected, consequently no pain is felt from its injection *per se*; it is soluble in its own weight of water; it will combine with adrenalin in any proportion without interfering with the physiological action of the latter, and it will be readily absorbed by the mucous membrane. The studies of Biberfield and Braun brought to light another extremely interesting factor concerning the novocain-adrenalin combination. Both experimenters, working independently of each other, observed that the adrenalin anemia on the one hand, and the novocain anesthesia on the other hand were markedly increased in their total effects upon the tissues. Consequently, a small quantity of this most happy combination is required to produce the same therapeutic effect as a large dose of each individual drug alone would produce when injected separately. The injection of a solution of the combined drugs is precisely confined to the injected area, general effects are therefore rarely produced.

Novocain is the hydrochloric salt of a synthetically prepared alkaloid, the methyl ester of p-amidobenzoic acid. It is a white crystalline powder, or colorless needle-shaped crystals, melting at 263 F., (156 C.). It may be heated to 200 F.,(120 C.) without decomposition. It dissolves in an equal amount of cold water, the solution having a neutral character; in cold alcohol it dissolves in the proportion of 1 to 30. Caustic alkalies and alkaline carbonates precipitate the free base from the aqueous solution in the form of a colorless oil, which soon solidifies. It is incompatible with the alkalies and alkaline carbonates, with picric acid, and the iodides. Its solutions may be sterilized by boiling without decomposition.

As stated above, the relative toxicity of a given quantity of cocain in solution depends upon its concentration; this same peculiarity is not shared by novocain. The dose of novocain may be safely fixed at one-third of a grain for a single injection. For dental purposes a 1½- or a 2-per cent. solution in combination with adrenalin has been injected without any ill results. For the purpose of confining the injected novocain to a given area, the addition of adrenalin in small doses, on account of its powerful vasoconstrictor action, is well adapted. It is the important factor which prevents the ready absorption of both drugs and consequently largely nullifies poisonous results. An injection of ten drops of a 2-per cent. solution of novocain labially into the tissue produces a diffuse anesthesia lasting approximately twenty minutes; the same quantity, with the addition of one drop of adrenalin chlorid solution, increases the anesthetic period to over an hour, and localizes the effect upon the injected area.

A suitable solution of novocain for dental purposes may be prepared as follows:

Novocain	10 grains
Sodium chlorid	4 grains
Distilled water	1 fluid ounce
Boil	

To each syringeful (two c.c.) add two drops adrenalin chlorid solution when used.

A sterile solution may be made extemporaneously by dissolving the necessary amount of novocain-adrenalin in tablet form in a given quantity of boiled distilled water. A suitable tablet may be prepared as follows:

Novocain	1-3 grain
Synthetic suprarenin hydrochlorid	1-1200 grain
Sodium chlorid	1-3 grain

One tablet dissolved in 20 minims of sterile water makes a 2-per cent. solution of novocain ready for immediate use.

Solutions for hypodermic purposes should preferably be made fresh when needed. A small glass dish and a dropping bottle constitute the simple outfit for such work. The dropping bottle should hold from one to two ounces. A suitable one is made by the Whitall-Tatum Co., of Philadelphia, and may be bought in the drug shops. It should be provided with a dust cap. "A groove on one side of the neck of the bottle, and a vent on the other connected with two grooves in the back of the stopper allow the contents to flow out drop by drop. A quarter turn of the bottle closes the bottle tightly." The water used for making the solution should be boiled and filtered, distilled water. The hypodermic solution can be made extemporaneously in a few seconds: Place a tablet in a sterile glass dish, add 20 minims (1 c.c.) of water, and to facilitate the solution, mash the tablet. The solution is now ready for immediate use.

THE HYPODERMIC ARMAMENTARIUM

A hypodermic syringe that answers all dental purposes equally well is an important factor in carrying out the correct technic of the injection. The injection into the dense gum tissue requires from 15 to 50, or even more, pounds of pressure as registered by an interposed dynamometer, while in pressure anesthesia 100 or more pounds are frequently applied.

The selection of a suitable hypodermic syringe is largely a matter of choice. All-glass syringes, glass barrel syringes, and all-metal syringes are the usual types found in the depots. After testing most of the dental hypodermic syringes offered in the dental depots within the last five years by means of the pressure gauge and in clinical work, subjecting the syringes to a routine wear and tear, the author has found that the all-metal syringes of the "imperial" types are to be preferred over other makes. They are usually made of nickel-plated brass, which, however, is a disadvantage, as the nickel readily wears off from the piston, and exposes the easily corroded brass. The Manhattan all-metal platinoid syringe gives the best general service, and we can conscientiously recommend it to our confreres. The syringe holds 40 minims (2 c.c.), is provided with a strong finger cross-bar, and is extremely simple in construction. The piston consists of a plain metal rod, without a thickened or ground piston-end or packing. The piston-rod is sufficiently long to allow about two inches of space between the cross-bar and the piston-top. This space is of importance, as it allows the last drop of the fluid to be expelled under heavy pressure without tiring the

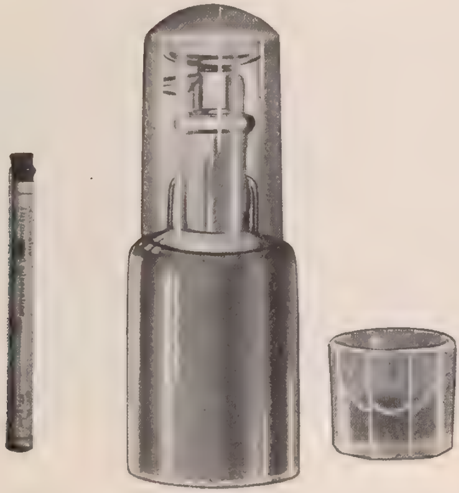

Fig. 2. Hypodermic tablets, dropping bottle with dust cap and glass dish for making the anesthetic solution.

fingers. The packing consists of leather washers inserted at the screw point, and are quickly removed and replaced if necessary.

The hypodermic syringe requires careful attention. It is not necessary to sterilize it by boiling after each use, unless it be contaminated with blood or pus. The simple repeated washings with alcohol and careful drying is sufficient. The cap is readjusted, and the piston-rod is covered with a thin film of carbonated vaseline, or surgical lubricating jelly, and placed in position. If the syringe is boiled, all the washers must be removed. The syringe is best kept in a covered glass or metal case, and a large bacteriologic Petri dish is suitable for this purpose. Leather-lined or felt-lined boxes afford breeding places for bacteria. Some operators prefer to constantly keep their syringes in an antiseptic solution when not in use, and others prefer to place them in a special sterilizing bottle, which bottles may now be purchased at dental depots.

Dental hypodermic needles should be made preferably of seamless steel, or, still better, of nickel steel, 26 to 28 B. & S. gauge, and provided with a short razor-edge point. Thicker needles cause unnecessary pain, and thinner needles are liable to break. Iridio-platinum needles are preferred by some operators, as they may be readily sterilized in an open flame. The needle should measure from a quarter to a half inch. For infiltration anesthesia one-inch needles are necessary, and curved needles of various shapes are essential in reaching the posterior parts of the mouth. The "Schimmel" needles are excellent, but do not, however, fit every syringe. For pressure anesthesia special needles are required, and may be bought at the depots, or quickly prepared by grinding off the steel needle at its points of reinforcement. The sterile needle should be kept in well-protected glass containers. The needles are sterilized after each use by boiling in plain water, dried with the hot air syringe, and immediately transferred to a covered sterile glass dish. The sterile needles should not be again touched with the fingers, and the customary wire insertion is unneccessary.

TECHNIC OF INJECTION

Various methods of injecting the anesthetic solution about the teeth are in vogue. For the sake of convenience we may be permitted to divide them as follows:

The subperiosteal injection.
The peridental injection.
The intraosseous injection
The perineurial injection.
The injection into the pulp.

Before starting any surgical interference in the mouth, the field of operation should be thoroughly cleansed with an antiseptic solution. A thin coat of the official tincture of iodin painted over the surface is very useful for this purpose. After the diagnosis is made the method of injection best suited for the case on hand is then decided. The necessary quantity and the concentration of the anesthetic solution is now prepared, and the syringe and hypodermic needle fitted ready for the work. To facilitate the ready penetration of the needle into the tissues, its point may be coated with carbolated vaseline. The correct position of the syringe in the hands of the operator and its proper manipulation is an important factor and has to be acquired by practice. The hand holding the syringe is exclusively governed in its movements by the wrist, so as to allow delicate and steady movements, and the fingers must be trained to a highly developed sense of touch. The syringe is filled by drawing the solution up into it; it is held perpendicularly, point up, and the piston is pushed until the first drop appears at the needle point, which precaution prevents the injection of air into the tissue.

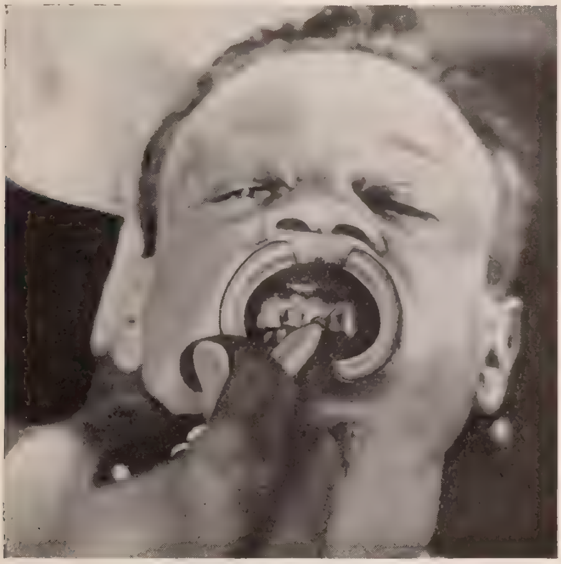

Fig. 3. Subperiosteal injection.

THE SUBPERIOSTEAL INJECTION

The subperiosteal injection about the root of an anterior tooth is best started by inserting the needle midway between the gingival margin and the approximate location of the apex. The pain of the first puncture may be obviated by a fine, very sharp-pointed needle, the simple compression of the gum tissue with the finger tip, by holding a pledget of cotton saturated with the prepared anesthetic solution on the gum tissue for a few moments, or by applying a very small drop of liquid phenol on the point of puncture. The needle opening faces the bone, the syringe is held in the right hand at an acute angle with the long axis of the tooth, while the left hand holds the lip and cheek out of the way. After puncturing the mucosa, a drop of the liquid is at once deposited in the tissue, and the further injection is painless.

Slowly and steadily the needle is forced through the gum tissue and periosteum along the alveolar bone toward the apex of the tooth, depositing the liquid under pressure close to the bone on its upward and return trip. The continuous slow moving of the needle prevents injecting into a vein. A second injection may be made by partially withdrawing the needle from the puncture and swinging the syringe anteriorly or posteriorly, as the case may be, from the first route of the injection. This latter method is especially indicated in injecting the upper molars. After removing the needle, place the finger tip over the puncture and slightly massage the injected area. A circular elevation outlines the injected field. The naturally pink color of the gum will shortly change to a quite anemic hue, indicating the physiological action of the adrenalin on the circulation. No wheal should be raised by the fluid, as that would indicate superficial infiltration and consequently failure of the anesthetic.

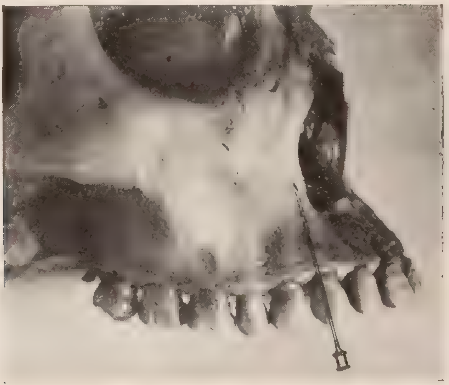

Fig. 4. Direction of needle in the subperiosteal injection about a cuspid.

As the liquid requires a definite length of time to pass through the bone lamina and to reach the nerves of the peridental membrane and the pulp, from five to ten minutes should be allowed before the extraction is started. The length of time depends on the density of the surrounding structure of the tooth. The progress of the anesthesia may be tested with a fine-pointed probe, and its completeness indicates the time when the extraction should be started.

The upper eight anterior teeth usually require a labial injection only, while the molars require both a buccal and a palatine injection, using a slightly curved needle for this purpose. Buccally, the injection is made midway between the mesial and distal root, and on the palatine side over the palatine root.

The lower eight anterior teeth are comparatively easily reached by the injection. The straight needle is inserted near the apex of the tooth, the syringe is held in a more horizontal position, and the injection proceeds now as outlined above.

The lower molars require a buccal and lingual injection. The curved needle is inserted midway between the roots, the gum margin, and the apices. The external and internal oblique lines materially hinder the ready penetration of the injected fluid, and therefore ample time should be allowed for its absorption.

If two or more adjacent teeth are to be removed, the injection by means of infiltrating the area, the gum fold directly over the apices of the teeth, is to be preferred. It is advisable to use a one-inch needle for this purpose, holding the syringe in a horizontal position, so as to reach a larger field with a single injection.

The injection into inflamed tissue, into an abscess, and into phlegmonous infiltration about the teeth is to be avoided. The injection into engorged tissue is very painful; the dilated vessels quickly absorb cocain without producing a complete anesthesia, and generally poisoning may be the result. In purulent conditions the injection is decidedly dangerous, as it forces the injection beyond the line of demarcation. If the abscess presents a definite outline, the injection has to be made into the sound tissue surrounding the focus of infiltration. If a tooth is affected with acute, diffuse or purulent pericementitis, a distal and a mesial injection usually produces successful anesthesia by blocking the sensory nerve fibers in all directions.

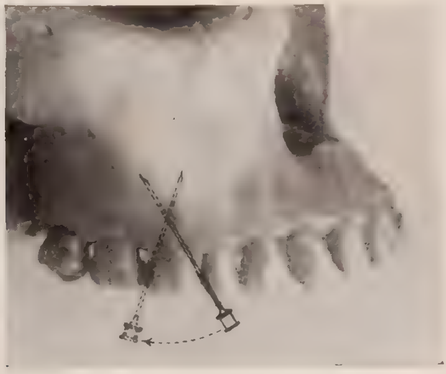

Fig. 5. Subperiosteal injection about an upper molar.

PERIDENTAL ANESTHESIA

The teeth or roots standing singly, or teeth affected by pyorrhea or similar chronic peridental disturbances, are frequently, quickly and satisfactorily anesthetized by injecting the fluid directly into the peridental membrane. This method is known as peridental anesthesia, and its technic is very simple. In single-rooted teeth a fine and short hypodermic needle is inserted under the free margin of the gum, or through the interdental papilla, into the peridental membrane between the tooth and the alveolar wall. Sometimes the needle may be forced through the thin alveolar bone as as to reach the peridental membrane direct. To gain access to this membrane in teeth set close together, separation is essential. It may be accomplished with an orange wood stick or by any of the various mechanical separators. By so doing, the body of the tooth is shifted to one side and thereby creating a slight space between it and the alveolar process.

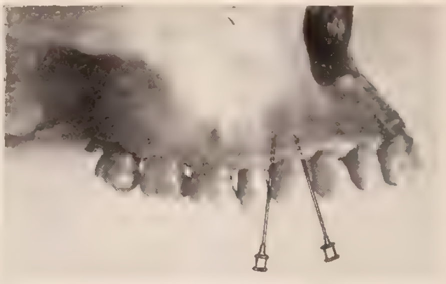

Fig. 6. Peridental injection about a bicuspid.

The injection is now made directly into the exposed peridental membrane. By reversing the separator, the tooth is shifted to the opposite side and the injected liquid is forced toward the apex of the tooth.

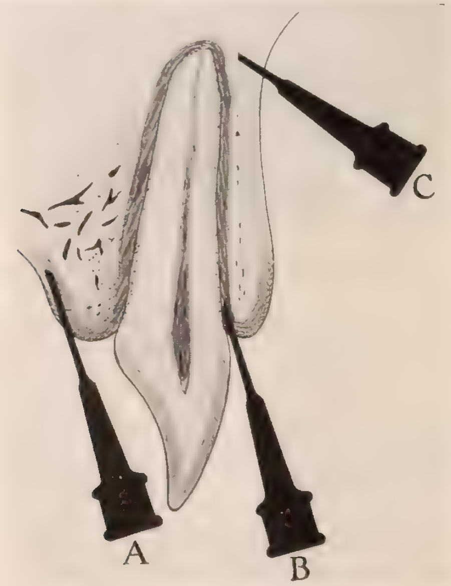

Fig. 7. *A*, subperiosteal injection; *B*, peridental injection; *C*, intraosseous injection about a cuspid.

A second injection is now made in this freshly exposed portion of the peridental membrane. Two, sometimes three, injections are necessary. To force the liquid into the membrane usually requires a higher pressure than that which is necessary for injecting into the periosteum covering the alveolar process, but the quantity of the anesthetic fluid is less than that which is required for the former injection. Acute inflammatory conditions of the peridental membrane and its sequelæ prohibit the use of this method. Peridental anesthesia is the purest form of local anesthesia, since the seat of the nerve supply of the tooth is very quickly reached, and as a consequence the results obtained are in the majority of cases extremely satisfactory, provided that general conditions justify its application. The method is especially serviceable for the removal of pulps in all such cases where contact anesthesia is not indicated or for temporarily desensitizing a tooth for operative procedures.

INTRAOSSEOUS INJECTION

To facilitate the passage of the injected fluid into the bone structure proper, Otte, in 1896, recommended a method by which he forces the anesthetic solution directly into the spongy cancelloid bone. Otte terms this procedure the intraosseous method of injection, and its technic is described by him as follows: After the gum tissue is thoroughly cleansed with an antiseptic solution, it is anesthetized about the neck of the tooth in the usual manner. After waiting two or three minutes, an opening is made into the gum tissue and the bone on the buccal side with a fine spear drill or a Gates-Glidden drill. The opening should be made more or less at a right angle with the long axis of the tooth, a little below the apical foramen in single-rooted teeth or between the bifurcation in the molars. The right-angle hand piece is preferably employed for this purpose. The drill

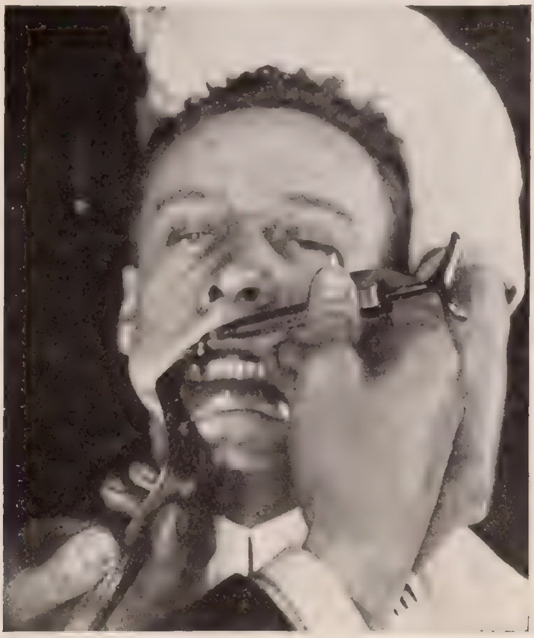

Fig. 8. Perineurial injection about the upper molars.

should be of the same diameter as the hypodermic needle. The gum fold is tightly stretched to avoid laceration from the rapidly revolving drill.

As soon as the alveolar process is penetrated, a peculiar sensation conveyed to the guiding hand indicates that the alveolus proper is reached, and the sensation felt by the hand is about the same as that experienced when a bur enters the pulp chamber. In this artificial canal the close fitting curved needle of the hypodermic syringe is now inserted, and the injection is made in the ordinary way. The quantity of fluid used is much less than is usually needed for a subperiosteal injection. The roots of the teeth are imbedded in a sieve-like mass of bone tissue (diploe), which allows a ready penetration of fluid when injected under pressure. Very recently, Masselink advocates this method of the anesthetization of any tooth in the mouth either for the purpose of extracting or the removal of its pulp. He employs a No. ½ round bur for penetrating the alveolar plate and a very short needle (about 1-16 of an inch) with a dull point for the injection.

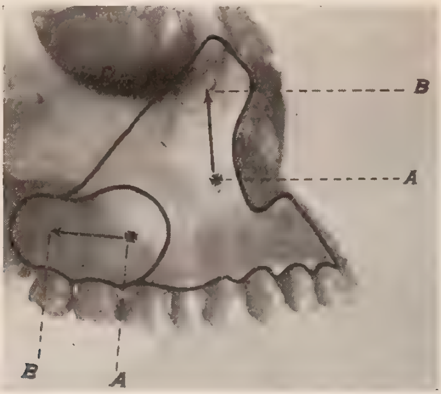

Fig. 9 Perineurial injection about the infraorbital foramen and the alveolar foramina.

PERINEURIAL INJECTION

For the anesthetization of a number of teeth in the upper or the lower jaw, conductive anesthesia by means of perineurial injection is preferably employed. The perineurial injection is made near the point of exit or entrance of the various nerves about their respective foramina. To anesthetize all the teeth of one-half of the upper jaw four injections are necessary, i.e., two buccally and two on the palatine side of the bone. A one-inch needle is required for such work. To reach the many small branches of the posterior dental nerves at the alveolar foramina, the injection is made buccally over the region of the tuberosity about ½ inch above the gingival line between the first and second molar teeth.

The second injection is made below the infraorbital foramen, so as to reach the middle and anterior dental nerves. With the index finger of the left hand the foramen is approximately located by exerting pressure upon the nerve-exit. The lip is lifted up with the middle finger of the same hand and the needle is now inserted between the apices of the cuspid and first bicuspid teeth. The needle is slowly pushed forward until its point is felt beneath the finger tip. To reach the nerve supply of the hard palate one injection is made near the posterior palatine canal, and the other near the foramina of Scarpa. The great palatine nerves pass through the posterior palatine canals on either side of the hard palate. The canals lie about three-eighths of an inch above the edge of the alveolar process and the last molar tooth. They move posteriorly with the eruption of the successive teeth. The nasopalatine nerves pass through the foramina of Scarpa (incisive foramen) which are situated in the line of the suture of the maxillary bones. If an imaginary line is drawn from the distal borders of the two cuspids and passing over the hard palate, the line will ordinarily pass through the foramina. The needle should be inserted directly back of the papilla, which lies posteriorly between the central incisor teeth.

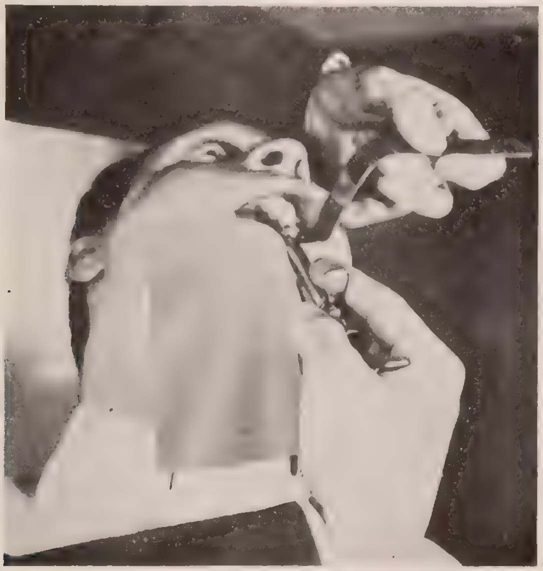

Fig. 10. Perineurial injection into the palate.

To anesthetize one-half of the mandible, three injections for the deposition of the anesthetic solution are necessary. The first injection is applied near the mandibular foramina, the second near the mental foramen, and the third into the incisive fossa. To locate the mandibular foramen in the mouth, the lingual surface of the ramus is palpated with the finger, the anterior sharp border of the coronoid process is easily felt about five eighths of an inch posterior of the third molar. The process passes downward and backward of the third molar, and enters into the external oblique line. Mesially from this ridge is to be found a small triangular concave plateau, which is facing downward and outward, being bound mesially by a distinct bony ridge, and covered with mucous membrane. As there is no anatomical name attached to this space, Braun has called it the retromolar triangle (trigonum retromolare). In the closed mouth it is located at the side of the upper third molar, and in the open mouth it is found midway between the upper and lower teeth. Immediately back of the mesial border of this triangle, directly beneath the mucous membrane, lies the lingual nerve, and about three-eighths of an inch farther back the mandibular nerve is to be found. This last nerve lies close to the bone, and enters into the mandibular foramen, which is partly covered by the mandibular spine.

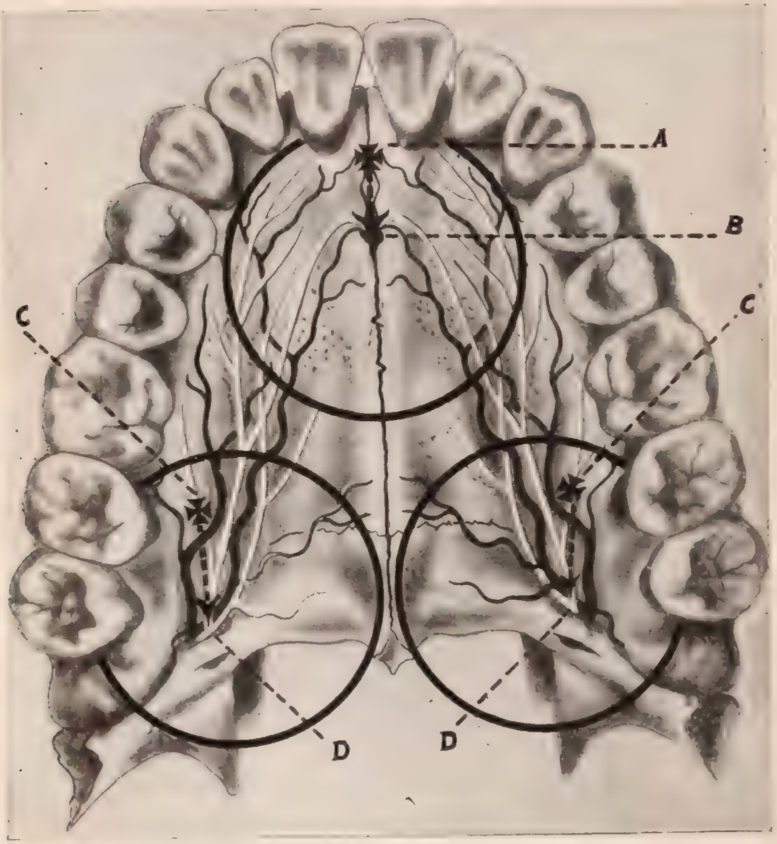

Fig 11. Perineurial injection about the foramen of Scarpa and about the posterior palatine canal.

Before starting the injection the patient should be cautioned to rest his head quietly on the head-rest of the chair, as any sudden movement or interference with the hand of the operator may be the cause of breaking the needle in the tissue. The syringe, provided with a one-inch needle, is held in a horizontal position, resting on the occluding surfaces of the teeth from the cuspid backward and slightly toward the median line. The needle is to be inserted three-eighths of an inch above and the same distance back of the occluding surface of the third lower molar, the needle opening facing the bone. This position will insure the correct direction of the needle point so as to reach the tissues immediately surrounding the nerves, and not lose the injection in the adjacent thick muscle tissue. The needle must always be in close touch with the bone, and is now slowly pushed forward, depositing a few drops of fluid on its way until the ridge is reached. About five drops of fluid are injected in this immediate neighborhood for the purpose of anesthetizing the lingual nerve. The needle is pushed very slowly forward, always keeping in close touch with the bone and depositing fluid on its way, until it is pushed in about five-eighths of an inch. It is important carefully to feel the way along the bony wall of the ramus, as the needle may have to pass over the roughened and bony elevations, which afford attachment to the internal pterygoid muscle. During the injection the syringe should remain in the same horizontal position as heretofore outlined.

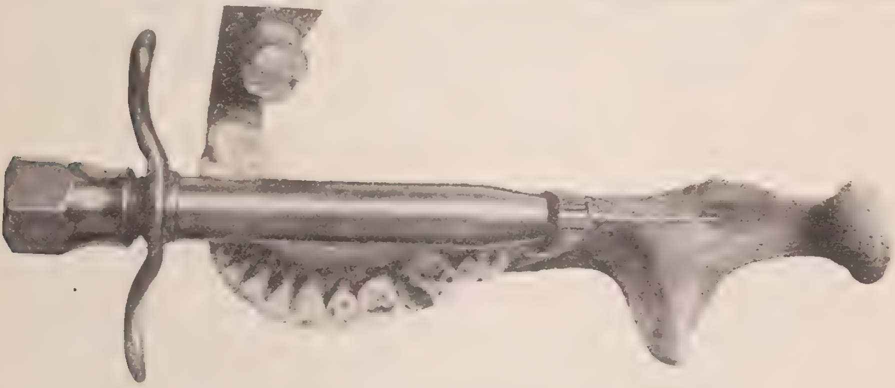

Fig. 12. Injection into the mandibular foramen.

Soon after the injection paresthesia of one-half of the tongue on the side of the injection occurs, which is soon followed by anesthesia of the mandibular nerve. Paresthesia of the mucous membrane and half of the lower lip is also established. The pulps of the lower teeth, including the cuspid and lateral incisor and the gum tissue on both sides of the jaw, are anesthetized, including a part of the anterior floor of the mouth. The complete anesthesia of the two nerves also anesthetizes the whole alveolar process in this region. About five minutes are required for the complete anesthetization of the lingual nerve, and at least fifteen minutes for the mandibular nerve. Braun claims that the injection is absolutely free from danger, while Romer states that danger may arise if the whole quantity of the solution should accidentally be injected into a vein.

The mental foramen lies midway between the superior and inferior border of the body of the mandible on its external surface, usually below the second bicuspid teeth. Its opening always faces posteriorly. An injection near this point increases the anesthesia in the bicuspid region. The incisive fossa is a shallow depression of the external surface of the mandible between the cuspid teeth. It may be located by the palpating finger immediately above the chin. A number of small foramina are found in this region for the passage of nerves and nutrient vessels. The lower incisors may be anesthetized by making injections anteriorly into the incisive fossa and one posteriorly in the region corresponding to the fossa. Usually, peridental anesthesia is to be preferred for these teeth.

Conductive anesthesia is serviceable if a number of teeth have to be removed at one visit. It should be borne in mind, however, that in average, only one-half of either jaw shoald be anesthetized at one sitting so as to keep the quantity of the injected anesthetic solution within the limits of ordinary dosage.

THE INJECTION INTO THE PULP

By pressure anesthesia, pressure cataphoresis, or contact anesthesia, as the process is variously termed, we understand the introduction of a local anesthetizing agent in solution by mechanical means through the dentin into the pulp for the purpose of rendering this latter organ insensible to pain. Simple hand pressure with a suitable instrument, the hypodermic syringe or the so-called high pressure syringe, is recommended for such purposes. Regarding the principles of pressure anesthesia, it should be remembered that we cannot force a liquid through healthy dentin by a mechanical device without injury to the tooth itself. If a cocain solution is held in close contact with the protoplasmic fibres of the dentin, the absorption of cocain takes place in accordance with the law of osmosis. The inhibition of the anesthetic is enhanced by employing a physiological salt solution as a vehicle. On the other hand, living protoplasm reacts unfavorably against the ready absorption of substances by osmosis for two reasons: (1) Its albumen molecule is relatively large and not easily diffusible, and (2) as an integral part of its life it possesses "vital" resistance toward foreign bodies. These latter factors are sufficiently demonstrated by the fact that it is very difficult to stain living tissue. Dehydration of the protoplasm increases the endosmosis of the anesthetic solution markedly.

When we apply the same "pressure" anesthesia upon carious dentin the above statements do not hold good. We are able to press fluids quite readily through carious dentin. We must bear in mind that such dentin has been largely deprived of its inorganic salts, leaving an elastic spongy matrix in position. By drying out this dentin and then confining the anesthetic solution under a suitable water-tight cover, the pressure applied by the finger is quite sufficient to obtain the results. Colored fluids may be readily pressed through such dentin and even stain the pulp.

In teeth not fully calcified and in so-called soft teeth, pressure anesthesia is more readily obtained while, according to Zederbaum, the process fails in "teeth of old persons, teeth of inveterate tobacco chewers, worn, abraded and eroded teeth, teeth with extensive secondary calcific deposits, teeth whose pulp canals are obstructed by pulp nodules, teeth with metallic oxides in tubules, teeth with leaky old fillings, badly calcified teeth—mainly all from one and the same cause, namely, clogged tubuli. In most cases no amount of persistent pressure will prove successful."

From the foregoing it will be observed that the so-called high pressure syringes possess little merit relative to pressure anesthesia. The pressure which can be produced by a good working all-metal syringe, holding it between the index and middle fingers and forcing the piston with the thumb, amounts to 250 to 300 pounds in the average man. The pressure required in pressure anesthesia to produce a perfect contact is usually much less than the above force.

METHODS OF ANESTHETIZING THE PULP

1. The pulp is wholly or partially exposed: Isolate the tooth with the rubber dam and clean it with water and alcohol. Excavate the cavity as much as possible and if the pulp is not exposed, dehydrate with alcohol and hot air. Saturate a pledget of cotton or a piece of spunk with a concentrated cocain or novocain solution, place it in the prepared cavity and cover it with a piece of vulcanizable rubber and with a suitable burnisher apply slowly, increasing continuous pressure from one to three minutes. The pulp may now be exposed and tested. If it is still sensitive, repeat the process. Loeffler states that "this pressure may be applied by taking a short piece of orange wood, fit it into the cavity as prepared, and direct the patient to bite down upon this with increasing force. In this way we can obtain a well-directed regulated force or pressure, and with less discomfort to the patient and operator." Miller described this process as follows: "After excavating the cavity as far as convenient and smoothing the borders of it, take an impression in modeling compound, endeavoring to get the margins of the cavity fairly well brought out; put a few threads of cotton into the cavity and saturate them thoroughly with a 5-to 10-percent. solution of cocain; cover this with a small bit of rubber dam, and then press the compound impression down upon it. We obtain thereby a perfect closure of the margin, so that the liquid cannot escape and one can then exert pressure with the thumb sufficient to press the solution into the dentin."

2. The pulp is covered with a thick layer of healthy dentin: With a very small spade drill bore through the enamel or direct into the dentin at a most convenient place, guiding the drill in the direction of the pulp chamber. Blow out the chips, dehydrate with alcohol and hot air, and apply the syringe provided with a special needle, having as nearly as possible a water-tight point. Apply slow continuous pressure from two to three minutes. With a round bur the pulp should now be exposed, and if still found sensitive, the process is to be repeated.

Recently a method has come into vogue which allows successful anesthetization of the pulp by injecting the anesthetic solution around the apex of the tooth. The spongy alveolar process, which contains lymph channels, allows the ready penetration of the fluid. The injection should be made close to the bone, pushing the needle slowly toward the apex, while the fluid is deposited drop by drop. No wheal should be raised by the injection, otherwise the benefits of the pressure from the dense gum tissue is lost.

According to Hertwig, the protoplasm of the cell primarily transfers irritation and, secondly, transmits absorbed materials. Therefore, the anesthetic solution has to pass through the entire dentinal fibre before the nerve tissue of the pulp proper is reached. Consequently a certain period of time is required before the physiological effect of the anesthetic is manifested. This period of latency is dependent upon the thickness of the intermediate layer of dentin or bone. The successful anesthetization of the pulp depends largely upon this most important factor of allowing sufficient time for the proper migration and action of the drug.

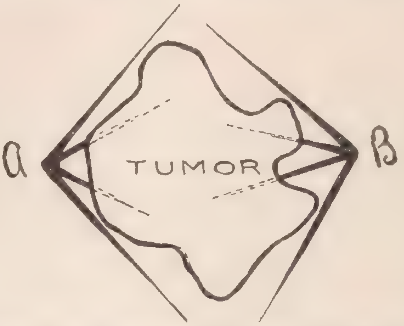

Fig. 13. Anesthetizing a small tumor by Rhomboid Injection. (Hackenbruch)

The anesthetizing of the peridental membrane for the treatment of pyorrhea alveolaris is a comparatively simple matter if carried out according to the methods as outlined under the heading of peridental anesthesia. Sometimes a topical application of a fairly concentrated novocain-adrenalin solution (about 10 per cent.) and applied to the pockets by means of cotton ropes accomplishes the desired purpose. The surgical treatment of pyorrhea is materially simplified if the tissues under consideration are relieved of sensation.

LOCAL ANESTHESIA FOR OPERATIONS ABOUT THE MOUTH, EXCLUSIVE OF THE EXTRACTION OF TEETH

In operating about the mouth for an abscess, a cystic or a solid tumor of the approximate size of a large walnut, a malposed tooth, or for any other purpose, the rhomboid infiltration according to Hackenbruch affords the simplest means of producing a most satisfactory anesthesia. After previously cleansing the field of operation with an antiseptic solution, a very small drop of phenol is placed at A and B to superficially obtund the point of puncture. The needle is quickly thrust through the mucosa at A, and at once slow pressure is exerted on the piston, moving the needle steadily along the external line of the tumor. The needle is now partially withdrawn, without, however, leaving the original puncture, and a second injection or as many as may be needed are made in opposite directions. This maneuver is now repeated at B, and thus a circumscribed infiltration of the whole tumor is obtained. If the tumor, etc., is very large, additional punctures and injections may be made as outlined in the schematic drawing. After ten to fifteen minutes' waiting, the extirpation of the tumor may be begun. For injecting the soft tissues other than the gum, a 1-percent. novocain-adrenalin solution—one tablet dissolved in 2 c.c. of water—is quite sufficient.

The anesthetization of the soft and hard palate is comparatively easily accomplished. The injection on the hard palate is started at the gingival edge of the alveolar periosteum on both sides of the jaw toward the median line. As the gum tissue is extremely dense, great force is required for a complete infiltration in this region, and only small quantities of the solution are required. The soft palate is easily infiltrated by inserting the curved needle posteriorly to the third molar.

Small tumors and cysts on the tongue or the floor of the mouth are best anesthetized by the rhomboid infiltration of Hackenbruch. For the complete extirpation of a ranula, the injection is made into the cyst wall near the periphery, after which the cyst is slit open and a small quantity of the anesthetic solution is injected into the inner surface of the cyst. Large cysts, tumors, and major operations on the tongue require the anesthetization of both lingual nerves. In injecting and operating on the floor of the mouth, the index finger of the left hand should be placed on its external surface as a guide to the needle or the knife.

Local anesthesia is indicated in all minor and in relatively many major operations on the mucous surfaces, the skin, and the teeth. Local anesthesia is not a substitute for general anesthesia; its usefulness is materially increased by familiarizing one's self with the modern methods of its production and with a perfect mastering of the technic. The danger of poisoning has been practically eliminated by using isotonic solutions containing a relatively small percentage of the anesthetic in combination with the alkaloid of the suprarenal capsule. Even if the danger of general necrosis is small under the very best conditions, the danger from local anesthesia is always less. The greater majority of all dental operations can be safely carried out under local anesthesia, provided the operator has acquired a complete working knowledge of the various components which, as a whole, constitute this important branch of dental therapeutics.

DISCUSSION

Dr. E. T. Loeffler, Ann Arbor: To have the privilege of discussing a paper from so distinguished a man as our honored guest should, indeed, be considered a great honor. The writer, however, in undertaking this most difficult task is fully aware of his limitations. Those of you who are familiar with Dr. Prinz's contributions to dental science and literature must evidently realize that the task is similar to that of discussing the contents of the Standard Dictionary or a volume of the Encyclopedia Britannica.

The first part of the paper really needs no discussion, except by way of emphasis. "*Divinum est opus sedare dolorem.*" The statement made by the immortal Hypocrates is true today as it was at that time.

If we take pains to carefully scrutinize the history in regard to the development of dental and medical science connected with the life history of the human body we find no other factor so important as that relating to the subject of pain. For centuries all efforts were largely directed towards the relief of pain. Today the most important factor to be considered is the prevention of pain.

We know less about pain than about any other symptom of disease. There seems to be no satisfactory explanation of the nature of its action.

If we are to discuss methods for producing local anesthesia we should know more about the tissues acted upon. Less is known about the nervous system than about any other part of the body. In regard to the metabolism, we have practically no knowledge whatever.

The brain itself is devoid of pain. The nerve trunks themselves have but little sensation. What then is pain, may we ask? Is it a special sense of afferent nerves or only an exaggeration of common sensation?

I am not introducing this as a part of the discussion but simply by way of emphasis. How can we prevent pain intelligently when we do not understand the *modus operandi* in which it is produced?

Dr. Prinz mentioned five factors to be considered in the practice of local anesthesia. I simply wish to emphasize the fifth, "Good judgment of the prevailing conditions." This is a very important asset of the operator who makes this branch of dentistry a specialty.

In regard to the nature, properties and action of the various agents in use for producing local anesthesia nothing need be said. The essayist has so thoroughly covered every phase of the subject that it leaves no room for discussion.

In regard to the armamentarium there are others who are better qualified to discuss this part of the paper than I am.

Under the head of the various methods of injecting anesthetic preparations it may not seem out of place to give a report of the work done by one of our instructors, Dr. Schroeder. The methods used were principally the subperiosteal and the peridental.

There were about one hundred cases of which there were four failures and eight partial failures; the remainder were absolutely successful. The above mentioned failures were on lower molars.

The injections were made to desensitize hypersensitive dentine, for the removal of pulps especially where other methods, as by the use of arsenic and cocain or novocaine in the usual way had failed.

Partially successful cases were those in which some sensation remained. Cervical cavities on upper cuspids, laterals and central incisors were prepared in several cases after one injection; the injection being made distally to the tooth.

In two cases untoward symptoms appeared after injection—great nervousness and a desire to vomit, due apparently to an improper form of adrenalin, the solution having become discolored.

For this work a 1-percent. solution of novocain and adrenalin (P.D.& Co.) was used. When using the interosseous method from five to ten drops were used by the subperiosteal and peridental about 1 c.c.

No undesirable after affects followed any of these cases; that is soreness, inflammation or suppuration.

We had in all about 90 or 100 cases in which injection was made into the mandibular space for the removal of impacted third molars and other operations. All of these were practically successful with no after effects. The technic and solutions used are those as outlined in Dr. Guido Fischer's book on local anesthesia.

We also beg to submit a report on the action of Buckley's Desensitizing Paste, for desensitizing hypersensitive dentine.

This work was directly in charge of Dr. Daniels, one of our clinical assistants. There were in all 97 cases, including nearly every kind of cavity in every part of the mouth.

With the exception of six cases the results were all successful. In case of the failures we might add that they were cavities in which it was difficult to seal in the paste to the exclusion of the saliva. It might be safe to assume that faulty manipulation had much to do with the outcome. Records of cases show that the paste was sealed in for periods varying from three hours to two weeks. The average has been from one to three days. In one exceptional case, a very sensitive cavity, the paste was sealed in but three hours with absolutely perfect results. In cases in which the paste was sealed in an unusually long time the results were perfect.

As far as we have been able to determine the effect upon the pulp is nil. In my own practice I have one particular case in which a tooth had two cavities, one distal proximal, the other labial. The paste was sealed in the proximal cavity only, and left in for two days, and then excavated absolutely without pain, while the labial cavity was very sensitive. Some pain is produced by the paste by sealing in deep cavities or in teeth that have ached.

A year or so ago we carried on a line of experiments with Velvo-Phenox, because some of my friends wrote to me and wanted to know what it contained and what there was about it. In the first place we wanted to determine as to whether it contained any arsenic. With the help of Dr. Ward and his laboratory we found it did not contain arsenic in any form. It is very hard to analyze an organic matter. He found it did contain some form of formaldehyde gas combined with something else. We weren't able positively to tell, but as far as we were able to determine it did not seem to have any detrimental effect on the pulp, although this afternoon a man who is in a better position to know than we, has told us this is probably what takes place. The same accusation is made as to Dr. Buckley's paste. All year long we have used it in perhaps nearly a hundred cases, with the special instruction that those cases should be watched to see whether it had any after-effect on the pulp, just as we did with the Velvo-Phenox. These are live questions. I am not giving this to you in any biased way, but just because we want to know. It is not a question of diagnosing or getting the theoretical part, but we, as practitioners, want to know what we can do after we go home. Shall we use this or not? Is it unfair to our patients? Is something going to happen? Is it the best method to use, or shall we combine several methods to get the best results? What shall we do?

In closing, I wish to say that our honored guest Dr. Prinz has given us a most timely and valuable paper. The subject has been covered so completely that little room has been left for discussion, except by way of emphasis.

Just one closing remark—I would like to make a direct and earnest appeal to every member of the dental profession, especially those who have the interests of humanity at heart, to make it their duty to employ, from now on, all the available means for the alleviation or abolishment of human suffering. Then, and not until then, can we hope to measure up to the standard of our high calling as efficient members of the healing art.

The President: We will next hear from Dr. Don M. Graham.

Dr. Graham: Before I take up the subject of local anesthesia, I want to say a word about the Buckley paste. My experience has been comparatively short. Dr. Loeffler would have us infer that the bad effects are nil. On the other hand, Dr. Prinz is most convincing in his statement that the effects are very bad and cannot be otherwise.

Dr. Prinz: Not with regard to the desensitizing effects.

Dr. Graham: Dr. Prinz says, and I agree with him, that its desensitizing effects are perfect, but its effects in devitalizing are uncertain. I have not used the paste much, but my assistant has for a long time, and he has insisted upon my using it. I have used it in possibly twenty cases with excellent results as far as desensitizing is concerned, but I have had two devitalizations. In those two cases, however, the nerves were almost exposed. The impression I wanted to leave is that it is too early to come to any conclusion as to what the results with it will be. The question must doubtless be left open for a number of years, for we all know that teeth will remain quiescent for years and then we may have an abscess. We cannot expect to use it on diseased pulps and avoid devitalizations.

The recent introduction of a safe and efficient local anesthetic has marked a distinct advance in dental therapeutics. Until recent years cocain, alone, or in combination, has been used with varying results, for several decades. The eucaines, tropococain, alypin, and many other allied drugs, have been introduced only to be discarded for the reason that they were found to be no safer than cocain, and generally less efficient in anesthetic properties.

Cocain hydrochlorate has always been open to the charge of unsafety. Additions of morphine, atropine, strychnine, chloretone and adrenalin were made with the hope of lessening its toxicity, but the fact remained that cocain hydrochlorate in any combination of known drugs did not fulfill the requirement of safety. It was the full realization of this that impelled the writer to use for some five or six months and also to recommend a solution of quinine and urea hydrochlorate; a combination, while safer, more painful and less efficient in anesthetic properties and by no means satisfactory.

The introduction of novocain, in combination with adrenalin, gave promise of a distinct advance in the direction of an ideal local anesthetic. This combination is capable of sterilization without deterioration, and is to say the least comparatively safe—some six times less toxic than cocain. With the introduction of this synthetic, the writer immediately discarded the quinine and urea hydrochlorate and began the use of the novocain-adrenalin combination, and for some three years has kept a careful record of several hundred anesthetics, administered under varying conditions, noting dosage, anesthetic effects, and any evidence of idiosyncrasies to cocainism. It was found that patients who had previously shown such idiosyncrasies behaved uniformly well, with the exception of a few cases which showed symptoms simulating cocainism. It is not therefore to be assumed that we have in novocain, an *absolutely* safe anesthetic, but it can truthfully be said that with due regard for dosage, it is reasonably, if not absolutely, safe. An effort was made to overcome this depressing effect, which was more evident in patients having idiosyncrasies also to cocain. A preliminary hypodermic of a heart stimulant, or the administration of whiskey was found not uniformly satisfactory. It was found later that a half glass of hot malted milk taken just previous to the administration of the anesthetic was more effectual and infinitely more agreeable to the patient. It has therefore become my practice to give in all cases, a preliminary half glass of hot malted milk.

I am in accord with Dr. Prinz, and all that he has said about the safety and efficiency of a 2-percent. novocain-adrenalin solution for operations in and about the oral cavity, such as the extraction of concealed roots, unerupted teeth, amputation, curettements, etc. In fact there seems to be no limit to its application when proper technic is employed and all necessary conditions for safety and efficiency are adhered to. It is not to be inferred from the essayist's paper, that the novocain-adrenalin anesthetic should be universally employed by the dentist. Ethyl chloride has its limited sphere of usefulness. Nitrous oxide and oxygen has still a very important field, while ether will be preferred for the more major operations of oral surgery. I am convinced, however, that novocain can be profitably employed in an increasingly greater number of cases, to the great satisfaction of patient and operator. The surprising thing to the writer is, that so little novocain is used in the dental and medical profession when its safety is considered.

When employing cocain the toxic element was ever in the forefront in the writer's mind and the patient lacked that honest, wholehearted reassurance which is so essential to the successful conduct of any operation. If a patient's attention is diverted by any anxiety evidenced by the operator, such as taking the pulse, or readjusting the chair, the effect is profoundly reflected in the patient. If, however, the operator has sufficient confidence in his anesthetic he is going to radiate and impart that confidence to the patient and in this way an untoward symptom is often counteracted, and a safe and a successful operation concluded. For this reason I employ a 2-percent. isotonic novocain-adrenalin combination with almost absolute confidence, in almost any and all conditions of oral surgery—from the amputation of a root to a radical antral operation.

The great advantage that a local anesthetic has over a general one, is the co-operation of the patient and the abundant time which it affords the operator to complete his work, as well as the saving of hospital expenses and the strain incident to hospital treatment. There is no attempt here to speak disparagingly of nitrous oxid anesthesia which undoubtedly has come to stay, for in many cases its employment is to be preferred to that of a local anesthetic especially where the operation is comparatively short, or where the tissues are badly inflamed, or the operative field is charged with pus, or again, if the patient expresses a decided preference for nitrous oxide. This applies particularly to the extraction of teeth where a great deal of muscular effort is employed. In the writer's practice, however, it can truthfully be said that a local anesthetic is used one hundred times to once of nitrous oxid or ether. In fact it is very rarely, within the last few years, that a patient is sent to the hospital for a general anesthetic and only in the more major cases and often because the patients themselves insist upon it.

In the matter of technic my practice does not differ materially from that of the essayist. Next to asepsis, and a safe solution, the technic of a local anesthetic is all-important. To prevent pain from the needle point, my practice consists of compressing the tissues to be injected. I find that this is more effectual than the topical application of phenol or the anesthetic solution. In a vast majority of cases, infiltration anesthesia is preferable, either the sub-periosteal or peridental injection being employed. Conductive anesthesia I employ only where extensive excisions are required, or when infiltration anesthesia has failed.

High pressure anesthesia for desensitizing or devitalizing purposes, I consider a doubtful procedure and unless the greatest care is used in the preparation of the solution and the amount of pressure employed we are likely to get pressure necrosis as a result. I find quite a large percentage of teeth so treated showing apical irritation and often abscesses on being radiographed. There is, however, no question in my mind of the value and safety of this procedure when employed under proper precautions for sepsis and a due regard for pressure. For this latter reason I am convinced that much of the sloughing of gum tissue following injections of local anesthetics, is the result of too much pressure. In dense resistant tissue considerable time must be allowed for absorption of solution, otherwise pressure necrosis is likely to follow which is in no way the result of sepsis.

In conclusion I want to thank most heartily the essayist for his very able, comprehensive and scientific paper. Indeed, the dental profession owes Dr. Prinz a deep debt of gratitude for having so thoroughly, scientifically, and persistently advocated local anesthesia in dental practice. Personally, I want to tender him my sincerest thanks for having early convinced me of the value of a safe local anesthetic which I consider the greatest advance in dental practice, and especially oral surgery, within the last decade.

DR. B, R. EAST, Detroit: There are a few things on which I disagree with Dr. Prinz. Suprarenin is one of the most active drugs known in chemistry, and the combination of sodium chloride or any other salt in a tablet which contains suprarenin or adrenalin is unsatisfactory, and, I think, unscientific, for the reason that the salt will absorb moisture enough from the atmosphere to make a chemical change take place in the suprarenin or adrenalin, and you will get a discolored tablet and have bad results.

I think, after the selection of the drug, the vehicle which carries it into the tissue is the next in importance after thorough antiseptic measures have taken place. If you take a turtle's heart, as Fischer has pointed out, or, as has been done in the Parke-Davis laboratories in the case of frogs, the injured tissue will continue beating; put in sodium chloride, and it will stop; than add a trace of calcium, and it will resume beating. which tends to show that sodium chloride is a protoplasmic poison unless supported by calcium or potassium. When a nerve is injured, for instance, cut, the tissue itself begins at once to deposit potassium salts in that tissue. The more potassium formed, the fewer impulses are carried to the brain, which would tend to point out that we should have the natural local anesthetic, potassium, in our vehicle when we inject. Cocain is, experimentally at least, on the sciatic nerve of the frog, on the nerve ending most satisfactory. For nerve-blocking novocain is the most satisfactory. Cocain is very toxic when not supported, but when supported with a drug such as chloretone, it seems quite harmless. In the dental clinics in Detroit, where we extracted 25,000 teeth this year, with some of the operators not of great experience, we have yet to discover the toxic action of cocain. These children will average nine or ten years old. And we have used chloretone and cocain in all cases. We give instructions to those operators to be sure to be clean, and use all the solution they can get in the tissue.

Have you noticed any difference in the healing of the tissue where local anesthetics have been used and where not? In some of the experiments, not yet complete, that we have carried on, using the extraction of dogs' teeth, the result seems to be that the tissues heal more rapidly if we keep them anesthetized. I think Fischer points out that insane people will sometimes tear open an abdominal incision, and infection in those cases rarely takes place.

A most important thing in local anesthesia is to operate within an hour or two after a meal and never on an empty stomach. I am riding the hobby of conductive anesthesia very hard, and I should hate to think I couldn't take a bright student and teach him in half an hour to use conductive anesthesia in both jaws, if he had had any bacteriology at all and knew how to keep clean. After using conductive anesthesia in all sorts of cases, I have yet to observe a bad result.

Dr. C. J. Lyons, Jackson: We have heard one of the most valuable talks this Society has ever listened to, and we should thank Dr. Prinz for coming here. There is one thing I wish to call attention to, and that is the fact that if we take up local anesthesia as outlined by Dr. Prinz, we must do absolutely what Dr. Prinz has told us to. Now we are going home and we are not going to do this. We are going home and forget some of the details Dr. Prinz has outlined, and that is where the trouble will come in the use of novocain or any other preparation in deep injections.

This anesthesia as advocated by Braun is based on four principles: First, absolute asepsis; second, thorough anatomical knowledge of the field in which we are working; third, a thorough knowledge of physiology that we may know how our anesthetic fluid is going to be taken up by the body, and fourth, complete attention to details. If we neglect any one of these four principles, we will fail in our efforts. I want to criticise, if I may, a part of Doctor Prinz's instrumentarium that he exhibits. In Doctor Prinz's hands this instrumentarium is all right, and in some other hands it would be all right.

In the average dentist's hands it will not do at all. Why? Because there are leather washers on that syringe, and those will cause trouble unless they are most carefully sterilized. Don't think you are going home from this meeting and take your old syringes that may look considerably like this, and try to make these deep injections, because if you do you will have deep infection, and that is one of the things we must guard against, particularly in conductive anesthesia. The only safeguard we have is to have our solution and instruments thoroughly sterilized and keep them so. You cannot do that as easily with this syringe as you can with a glass syringe. As to the danger of the glass syringe breaking, I want to emphasize what Dr. Graham has said, that it is not necessary in making an injection around the jaws to exert a great deal of pressure; if you will let the tissues take up your solution as you are injecting it, you can take the finest syringe and make these injections perfectly satisfactory. If you are going to create a great amount of pressure with a glass syringe there would of course be danger of breaking, but it is not at all necessary.

I am glad Doctor East brought up the point of the calcium and potassium chlorides in connection with our normal salt solution and I wish Doctor Prinz would answer that when he closes the discussion, as to whether the calcium and potassium as advocated by Fischer adds anything to the normal salt solution, and whether the sodium chloride in combination in the same tablet with suprarenin and novocain will disintegrate that tablet. That is the criticism Fischer makes.

Doctor Prinz said to experiment on your relatives. Don't experiment at all. If you are going to take this work up, take it up so that your technic will be as definite as in cavity preparation for a gold filling. If you do that, you will succeed; if you do not, you will fail.

Some years ago ether spray was employed, with good results, in the preparation of sensitive cavities. It was dropped, largely, I believe, because of the objectionable ether odor. If the ether employed had been reduced to a minimum and that minimum retained for its psychological influence only, the idea might now be universally employed.

The ether has nothing to do with desensitizing the dentine, at least air at a pressure of from 15 to 25 pounds, directed in a fine stream into a sensitive cervical cavity, works equally well. I use a spray bottle with a long flexible nozzle, which can be readily bent to suit the case. Through this the assistant directs the air current upon the revolving bur and those dreaded cervical cavities are usually excavated without pain. Bur and air should be applied at the same time. If the cold air is turned into a sensitive cavity without the bur pain is produced, but when the air and bur are used together very little, if any, discomfort is experienced. I keep a piece of absorbent cotton in the spray bottle and onto it pour two or three drops of ether before operating, solely for its psychological effect. Try it!

Doctor Dow: What air pressure do you use?

Doctor Bowles: I have the pressure of the city water in Detroit.

Doctor Prinz (closing): Some one said a local anesthetic should not be administered on an empty stomach, and Doctor Graham suggested the giving of a glass of malted milk. The warm milk is of service in that it furnishes nutrition on one hand, and on the other hand it gives the stomach something to do during that period to distract the effect.

Doctor Graham spoke about pressure. You will remember I said some men have used from 1500 to 2000 pounds' pressure, and as far as gum tissue is concerned, 50 to 60 pounds, but if you use that pressure, you do injury to the tissue. Apply that amount of pressure on other parts of your body with the injection of an isotonic solution, and necrosis is sure to follow. And especially with the thin layer of muscular tissue that covers the jaw, we can understand why under this acute pressure injury would result We should avoid it, if there is a chance to do so.

Doctor East has called attention to the action of the chlorides alone and then in combination with certain other salts on a turtle's heart. That is true. Take sodium chloride and place a turtle heart in it, and it will not have any effect. It is true that in the millions of cases where normal saline solution has been injected there has never yet been known one single case of hemolysis of the blood. But we are not concerned with the heart. It is stated that heart failure may be the result of the injection. If it does occur, it is not from the effect of the anesthetic; but possibly from the nervous impulse or the general reduction, of the nervous system as a whole that causes heart failure. Braun has shown that a normal saline solution as a vehicle of the anesthetic is the ideal medium. When it comes to making a solution for experimental work on animals where the heart is concerned, the Ringer solution is essential. I have been using sterilized hydrant water, and here I have just the amount of calcium salts which one needs.

Of course, if a tablet is exposed to moisture, decomposition will take place, but if a tablet is prepared properly and kept tightly corked it will remain perfect. I have had tablets in my possession for several years, kept under ordinary precautions, which have remained perfect.

We could spend hours and hours of discussion on what causes pain in the dentin. That is not determined as yet. One man says there are nerves in the dentin; another man denies it absolutely. We cannot conceive of pain without the nervous impulse, however we do know we have sensitive cavities occasionally. In hypersensitive dentin there seems to be a hydrostatic pressure produced in the dental tubuli. We know when we dry out dentin we get an area where the moisture has been removed, and in that area there is no further sensation. So with Doctor Bowles' apparatus, he goes on using his air blast, and keeps on cutting, and he cuts away the area that has been dried; if he stops his air, he gets sensation. In normal dentin there is no increased hydrostatic pressure.

Doctor Loeffler says he hasn't observed any bad results from the formalin paste. I have analyzed it, and was able to show the presence of thymol, formalin, yellow vaseline, and a small amount of a substance that seems to be charcoal. As to those cases which have not shown any disturbance, keep in mind that with such a protoplasm poison as formalin the effect is gradual, and the pulps die very slowly aseptically. Try the paste in a normal tooth that you know you will have to extract, apply the paste mixed with a little methylene blue, seal it in, and then extract after two days and make a section by grinding it down, and you will find the entire pulp is stained blue and has a leathery appearance. It is the result which formalin will produce when it comes in contact with living tissue. It seems that the blood becomes affected, first, and it means that later the nerve tissue becomes affected. I cannot retract my statement that living pulps under the formalin paste are going to die. It may take months, but they will finally die, because the action of formalin is unlimited, and you haven't anything in your hands to check it. Take silver nitrate and place it in a cavity, and it will enter perhaps 1-32 in., and if you keep it there ten years, it will not go any farther because it is self-limiting. Zinc chlorid is not self-limiting; in a deep seated cavity it will also kill the pulp. Mercury bichlorid is absolutely self-limiting, because the precipitated albuminate of mercury is so hard and dense that it will not allow its further progress.

Relative to the relationship between novocain and cocain, as far as the Harrison law is concerned, you should register, because you may use compounds containing cocain even though you may not know it. The law is, of course, not enacted for the purpose of doing harm in the profession, but to do away with drug fiends. I have a letter from the Treasury Department stating that novocain as yet is not subject to the law.†

As to an anesthetic that inhibits sensation for a prolonged period after the operation, I do not believe such an anesthetic has any place in oral surgery.

Such anesthetics are excellent for operating for hemorrhoids, for instance, where one desires cessation of sensation for weeks afterwards. But when it comes to extracting a tooth, and one makes an injection that prevents the recurrence of sensation in the injected region for three or four days, your patient comes back, and you look into his mouth and find a terrific odor and necrosis which the patient knows little about because sensation has not returned. We want the sensation to return as soon as possible after the operation.

As to the syringe, the Luer syringe is very serviceable, and it can be used with the greatest satisfaction. But it so happened, and it will happen to you, that in cleaning the syringe the little point fell into the porcelain sink and broke. The Luer syringe may now be obtained with a little metal frame so that the point will not slip. But if you will sterilize the all-metal syringe, and keep it aseptically, there is no reason why it should not be aseptically clean. I object to the packing myself. If we could overcome the question of packing in a metal syringe, it would be the ideal syringe, but I do not think it can be done.

As I said before, I am delighted to be with you today. As Doctor Loeffler has said, this subject is a live one, and when pain exists, and you can overcome that pain, and do it scientifically, and in such a way as to do the least harm to the patient, it is the thing we should aim to do.

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†Since the reading of Dr. Prinz's paper, novocain and its solutions have been placed under the operation of the Harrison Act temporarily.—*Ed.*

Activity is the center-board, the counter-balance of life. Busy men, men who make and keep themselves busy, always live longer and, of course, more useful and enjoyable lives than idle ones.

The French Birth Rate

The population of France in 1910 was 39,252,245. During that year there were 774,358 births and 703,777 deaths, making the net excess of births over deaths 70,581. In the previous year the excess of births over deaths was only 13,424, the number of deaths having been 52,768 greater than in 1910. In certain sections of the country the death rate considerably exceeded the birth rate. For the five-year period from 1901-1905, the number of births per 1,000 of population in some of the leading European countries was as follows: In Holland, 155; in Germany, 349; in Great Britain, 121; in Austria, 113; in Italy, 106, and in France, 18.—*Med. Rec., N. Y.*

THE POSSIBILITIES OF MODERN AMALGAMS*

BY HERBERT LOCKE WHEELER, D.D.S., NEW YORK, N. Y.

SO-CALLED PORCELAIN CEMENTS, really silicate cements, really the plain old oxyphosphate with silicate added to the zinc-oxide, and later gold inlays, have so occupied the attention of the profession that amalgam may scarcely be said to have been considered for the last ten or fifteen years, with the exception of some interesting work that has appeared now and then in the various journals.

Now let us take up the advantages of amalgam in filling cavities, small or large, in molars and bicuspids. What can we use in its place?

To be sure, we can use the good old-fashioned gold foil which, were it not for the excessive nervous strain its use compels for the patient and dentist both, is really the ideal plug for a cavity in a tooth; but the time required to place it, the discomfort, and sometimes expense to the patient, are such as to practically prohibit its use in ninety-nine per cent. of the cases requiring treatment.

The gold inlay can be made almost as good as the gold foil filling, but usually is not. Although comparatively new in the list of filling materials, it is being used a great deal, and my observation leads me to the conclusion that in many instances there is liable to be a slight overhanging edge, and in still more instances there is likely to be a crevice, same as there is in the porcelain inlay.

In the porcelain inlay, which is also used by some enthusiasts for restoration purposes in molars and bicuspids, there is invariably sooner or later a crevice caused by the disintegration of the cement in which the inlay is set.

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*Read before the Lake Erie Dental Society, 1914.

Amalgam then furnishes a means of applying a plug or filling which can be placed as closely as gold foil to the tooth substance, and if properly finished and polished, may make as smooth a filling as the best of gold fillings. It has the advantage that it can be placed much more rapidly than gold; is more easily polished and finished; more easily shaped to the desired form, and is as lasting.

When I say that amalgam is as lasting, I am, of course, considering the modern alloys that are furnished us, which have been produced along the lines suggested by Dr. G. V. Black's experiments, as they appeared in the *Cosmos* in 1896 and 1897.

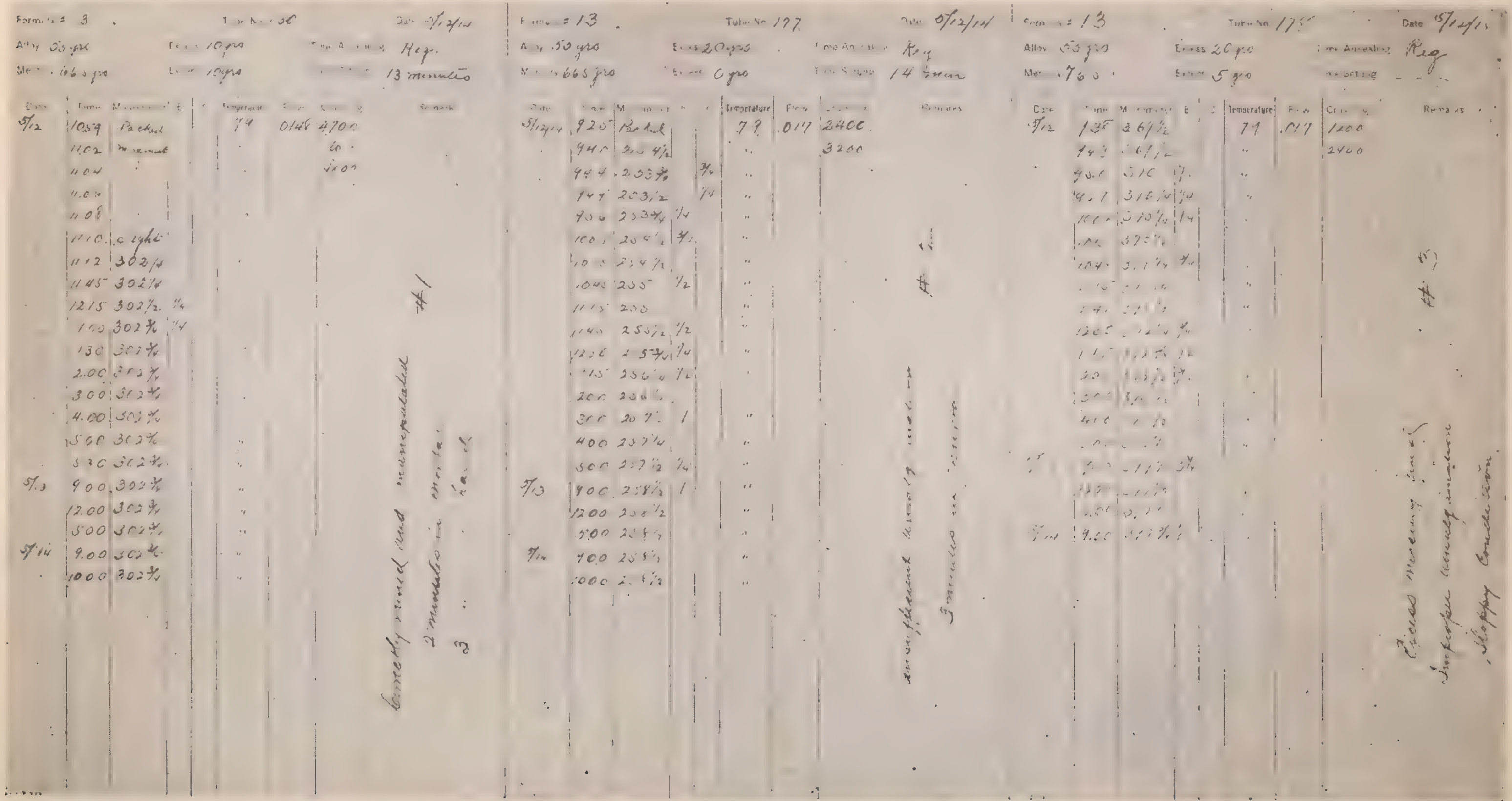
The older type of alloy, which had less silver and a varied composition, flowed badly and as a result often creviced badly and left a space between the filling and the tooth which was as serious oftentimes, and sometimes *more* serious than the crevice that we get from the disintegration of the cement in porcelain inlays, and also in some cases in gold inlays.

But the modern alloy, which contains from 65 to 68 per cent. silver, and around 26 or 27 per cent. of tin, with a slight amount of copper, and an almost negligible amount of zinc, if properly mixed and handled, will give as perfect an edge as the gold filling, if carefully packed, and has a sufficient resistance to the stress of mastication to place it, so far as it is acting as a plug is concerned, practically on an equality with the gold foil filling.

With the advantages then of being more readily and more quickly placed, of retaining its shape equally as well as gold foil, of being quite as easily polished and equally as strong and durable in its resistance to stress, why should the profession be constantly seeking to place something that has not anywhere near as good a record as a tooth-saver as this same modern amalgam? Why should gold inlays be placed with improperly fitting edges, at an expense very much greater, where amalgam will do better? Why should silicate cement, or any other kind for that matter, or porcelain inlays be placed, where amalgam is so far superior from every possible point of view that if an intelligent dentist were choosing it for his own mouth, he would unhesitatingly demand the amalgam?

Is it because of its unsightliness? Does any one really believe that a properly polished amalgam filling lying back of the first bicuspid in the shadow of the lips is as unsightly as gold in a similar position, say nothing of being more so? I have observed the mouths of patients for many years. I think in fillings upon the occlusal surface it is quite possible that gold is less unsightly than amalgam, or not more so, but in large contour fillings, and gold crowns especially, to my mind are a great deal more unsightly than amalgam and have no superior virtues. Gold caps especially, in a vast majority of cases where they are used, are a delusion and a snare, and for usefulness, economy and appearance are not to be for one moment compared with good amalgam.

I have brought here today some samples of true dentalloy, which is the amalgam I have used personally in my practice for many years.



Formula # 3 Tube No. 36 Date 5/12/14
Alloy 50 grs Excess 10 grs Time Annealing Reg.
Mercury 665 grs Expressed 10 grs Time Setting 13 minutes

Date	Time	Micrometer	E	C	Temperature	Flow	Crushing	Remarks
5/12	10.59	Packed			74	.0146	4700	
	11.02	[illegible]					[illegible]	
	11.04						[illegible]	
	11.06							
	11.08							
	11.10	[illegible]						
	11.12	302¼						
	11.45	302¼						
	12.15	302½	¼					
	1.00	302¾	¼					
	1.30	302¾						
	2.00	302¾						
	3.00	302¾						
	4.00	302¾						
	5.00	302¾			"			
	5.30	302¾			"			
5/13	9.00	302¾			"			
	12.00	302¾			"			
	5.00	302¾			"			
5/14	9.00	302¾			"			
	10.00	302¾			"			

#1

Correctly mixed and manipulated
2 minutes in mortar
3 " " hand

Formula # 13 Tube No 177 Date 5/12/14
Alloy 50 grs Excess 20 grs Time Annealing Reg
Mercury 665 grs Expressed 0 grs Time Setting 14 min

Date	Time	Micrometer	E	C	Temperature	Flow	Crushing	Remarks
5/12/14	9.20	Packed			79	.017	2400	
	9.40	[illegible]			"		3200	
	9.44	253¾		¾	"			
	9.47	253½		¼	"			
	9.50	253¾	¼		"			
	10.00	254½	¾		"			
	10.30	254½			"			
	10.45	255	½		"			
	11.15	255			"			
	11.40	255½	½		"			
	12.30	255¾	¼		"			
	1.15	256¼	½					
	2.00	[illegible]						
	3.00	257½	1		"			
	4.00	257¼			"			
	5.00	257½	¼		"			
5/13	9.00	258½	1		"			
	12.00	258½			"			
	5.00	258½			"			
5/14	9.00	258½			"			
	10.00	258½			"			

#2

Insufficient amalgamation
3 minutes in mortar

Formula # 13 Tube No 175 Date 5/12/14
Alloy 50 grs Excess 20 grs Time Annealing Reg
Mercury 760 Expressed 5 grs Time Setting —

Date	Time	Micrometer	E	C	Temperature	Flow	Crushing	Remarks
5/12	1.35	361½			74	.017	1200	
	1.43	361½			"		2400	

#3

Excess mercury used
Improper amalgamation
Sloppy condition.

The three mounted teeth which are shown, which contain amalgam fillings, look very much alike, but they are different in character. The mixes were made differently with regard to proportions and manipulations; the fillings inserted to show appearance in the teeth, and tests made of each of these mixes to show movement in setting at intervals by micrometer readings, which show shrinkage or expansion, and strength under pressure.

The blocks made for testing purposes were of uniform size and shape. The cards show the proper readings for shrinkage or expansion during the setting, and for a number of hours after the setting has taken place.

Mix No. 1, which was properly made, had the following composition:

Alloy	55 grains
Mercury	66 5-10 grains

It showed a flow of .0148 and withstood a crushing force of over 4700 pounds. This No. 1 mix was made in the following way:

Nine parts by weight of alloy to eleven parts by weight of mercury, mulled in a mortar for two minutes and then worked in the palm of the hand with the thumb for two and a half minutes, after which the excess of mercury was squeezed out and the amalgam inserted in the tooth cavity with a thrust and a slight rotating movement of the plugger.

Mix No. 2, which had the same proportion of alloy and mercury, was mixed the same as No. 1, except that it was mulled in a mortar for from one and a half to two minutes, and without being mixed with the hand, the mercury having been squeezed out, the amalgam was packed in the cavity.

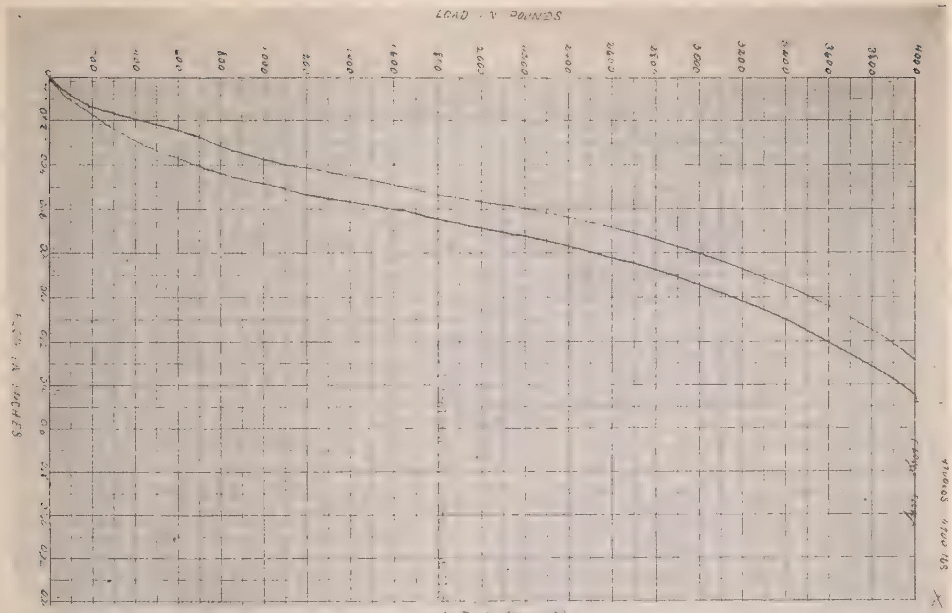
No. 2 showed a flow of .017, and withstood a crushing force of about 3200 pounds.

No. 3 was made with an excess of mercury; 55 grains of alloy and 76 5-10 of mercury. The amalgam was not packed densely, but condensed enough to make a complete filling. This showed a flow also of .017, but only withstood a crushing force of 2400 pounds.

It would seem from these experiments that this amalgam, even if carelessly mixed, was sufficiently hard when set to withstand any reasonable pressure that might be demanded of it.

It is not improbable that a large number of amalgams of the modern time might show up as well as this. I am sure I do not know, because I am in the habit, when I find an article that is satisfactory to me, of using it until I am satisfied that it will not accomplish that which I desire of it, and I have not reached that time as yet in the use of True Dentalloy.

Will the profession arrive at a point where their judgment in the use of fillings will be dictated not by what the prejudices or customs or fads have been of the dentists who have gone before, or will we sometime come to realize that if dentistry is to become a profession (I should say, if dentistry is a profession, and I believe it is), shall we consider what is the best under the circumstances that present themselves to us; the physical


LOAD IN POUNDS
200
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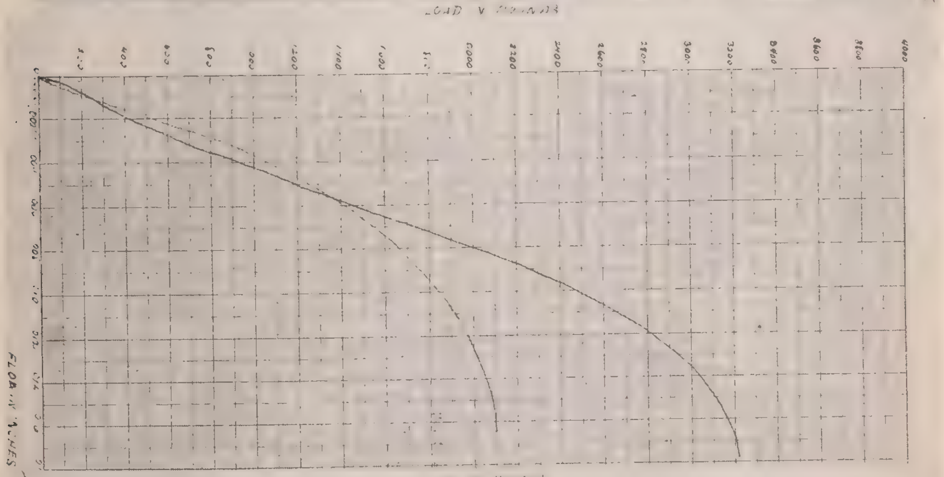
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
FLOW IN INCHES
4700 LBS


LOAD IN POUNDS
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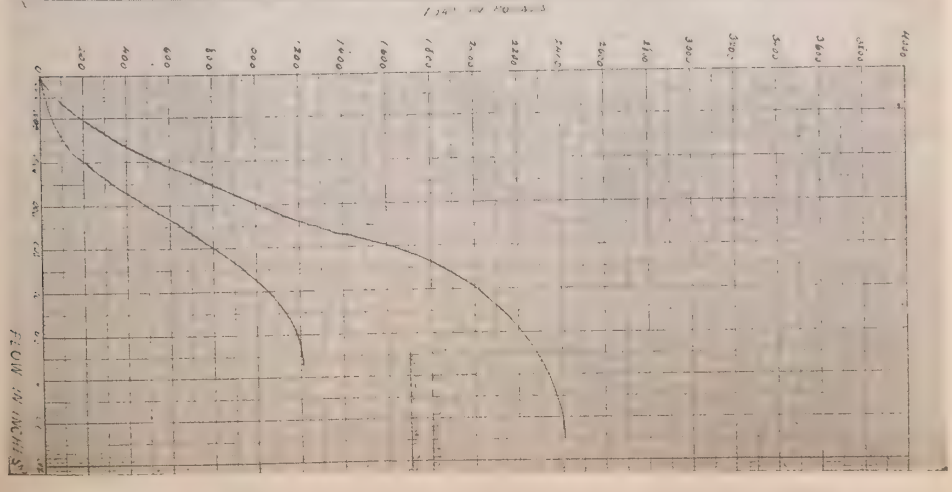
4000
FLOW IN INCHES


LOAD IN POUNDS
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4000
FLOW IN INCHES

welfare of the patient; the probable effect of the fluids of any particular mouth upon the filling; the ability of the patient to withstand the wear and tear; our own ability to do both the patient and ourselves justice without so over-straining our muscular and nervous system that we are obliged to retire from practice long before we should have reached our age of deterioration?

It seems to me, as I have said before, that it is quite as reasonable for a physician to attempt to treat all patients with the same remedy for what appears to be the same disease, as it is for a dentist to attempt to advocate the use of any particular material under a given condition, or to decry any particular filling unless it has by the force of logic, all-around superior qualities for the purpose for which it is designed.

I cannot, therefore, advocate amalgam to the exclusion of everything else, but I can and do advocate the use of amalgam in the building up of broken-down molars and bicuspids, in preference to either gold inlays or gold caps, and more especially in preference to gold caps unless there is some specific reason why the inlay or cap is better; that is, unless it is almost beyond a question of a doubt that it will give the patient superior service and not be a greater menace to his welfare through producing conditions in the mouth that cannot readily be cleansed; and when you have used the best judgment that you have, and have decided on any material, there is no reason why you should not receive a fee, not for selling amalgam or gold, based upon the cost of the material, but for judgment used and services rendered, and upon this basis an amalgam filling in its proper place is ofttimes as valuable as a gold, porcelain or cement filling, and sometimes is more valuable.

A CLEFT PALATE CASE*

BY E. H. HUBBUCH

Under the heading of "A Cleft Palate Case," a method of taking impression in two parts, first the impression of cleft, then another impression with the first impression *in situ*, enabling easy removal. Construction of cast, breaking same, to facilitate forming of vellum in modeling compound or wax, with flanges to make same movable with muscles of palate, trying in mouth and making necessary changes. Investment and packing with vellum rubber. One method (the old one) of making permanent flasking in four parts, so as to enable us at any time to duplicate soft vellum. A new way, using Metalline, which necessitates but two parts in flask. Impression with vellum *in situ* to make rubber denture, to which vellum is buttoned.

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*Clinic Kentucky State Dental Society, 1914.

STANDARDIZING THE AMALGAM FILLING*

BY WALTER G. CRANDALL, D.D.S., SPENCER, IOWA

THE USE OF AMALGAM as a material for restoring portions of the human teeth is of comparatively recent date. It is probably well within the past century that its first employment was recorded and within half a century that its use has become at all common. Indeed, many men who are active in the practice of dentistry today recall very vividly the contention over the material when its introduction was first becoming general throughout the country. Amalgam was then in such ill repute that its use by any dentist was sufficient to bar him from membership in the dental societies of that time and from any association with his confreres.

However, it is not the intent of this article to treat of the amalgam of the past, but of the amalgam of the present and its possibilities. The dental profession of the past fifty years has been a live and growing one. Indeed, it would not be far amiss to say that the past half century has seen the evolution of dentistry from an ordinary trade to one of the most progressive of the scientific professions. The qualities of amalgam have been developed to meet the more exacting demands of this rapidly growing profession.

The clinical experience of the past has had its part in developing amalgam, for we have been taught by such experience the wonderful tooth-saving qualities of even the poorest amalgam used in the most careless and indifferent way; it has served to show us what value has lain hidden in these metals, awaiting the result of scientific research. All scientific development of amalgam must center about the one man who thoroughly investigated, classified, and recorded the minute actions of the dental alloy metals. If, for no other reason, his name will always live because of his work on alloys. Two decades have passed and we have only begun to realize the heritage that is ours through the efforts of Greene Vardeman Black. His work was the first great step in standardizing the amalgam filling and will serve as a basis for future investigations.

Notwithstanding the work of Doctor Black and the publicity which has been given it, the fact is, and the evidence is all about us to prove it, that there is no standard system for amalgam work such as there is for most other dental operations. For instance: How much force is required to properly condense a given quantity of amalgam? What are the requisites of a good alloy? Should a cavity have a cement lining for amalgam, etc., etc.?

It is the purpose of this article to bring before you, in a manner as plain and emphatic as possible, some of the more important principles essential to the standardizing of amalgam work. In order to do this as systematically as possible, it seems desirable to make the following divisions of the subject:

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*Read before the Northern Indiana Dental Society, 1914.

ESSENTIALS FOR STANDARDIZED AMALGAM TECHNIC CLASSIFIED

I. Proper cavity preparation.
II. Accurately tested alloys of the greatest strength and stability.
III. Correct manipulation and instrumentation.
IV Contour and finish of filling.
V. Profitable fees.

I. PROPER CAVITY PREPARATION

Scientific cavity preparation is just as essential for a good amalgam filling as for any other material. The writer is inclined to the belief that the most frequent cause of failure of amalgam fillings is poor cavity preparation. Without a properly prepared cavity, no filling material is given a fair chance to prove its worth. It would be impossible, in an article of this length, to consider scientific cavity preparation exhaustively. The writer would advise those who wish such information to make a close study of Black's "Operative Dentistry," or to take a course of clinical instruction with those who are masters of this scientific system.

The color of amalgam is such that it should rarely, if ever, be used in any of the teeth except the bicuspids and molars. Therefore, we shall consider, briefly, only such cavities as occur most commonly in these teeth.

In the main, cavity preparation for amalgam should be the same as for gold. The ideal cavity is a box form, with flat seat and walls at a right angle. This, of course, becomes complicated in many forms of cavities, but the same principle should be followed in any cavity where stress will be applied to the completed filling. Doctor Black gives as the steps in cavity preparation the making of the (1) Outline form; (2) Resistance form; (3) Retention form; (4) Convenience form; (5) Removal of any carious dentin; (6) Finish of enamel walls; (7) Making a cavity toilet.

We can but briefly consider these various steps where they differ from the usual preparation for gold foil.

Outline Form

The outline form is the outline of the cavity upon the enamel surface. It must be of such form that it will place all of the margins in areas which are comparatively immune to initial decay.

For cavities on the proximal surfaces, the gingival margin, or seat, of the cavity, should be just beneath the free margin of the gum. It has been proved that decay rarely, if ever, starts at this point when the tissue is in a healthy state. The buccal and lingual margins must be so placed in the embrasures that food will sweep over them and so cleanse these surfaces that it will be impossible for plaques of bacteria to form and start a new area of decay. Upon the occlusal surfaces of such cavities, under normal conditions, the outline form should include that portion of the occlusal surface which is contiguous to the cavity, and should extend and include all fissures which are susceptible to future decay. Where the occlusal and proximal portions of the cavities join, the cavity should be cut as broad as conditions will permit, taking due caution not to approach too near the summit of the cusps where the enamel rods lie in a direction which will cause poor margins. Due caution should also be taken not to cut too deeply into the dentin at this point, as the horns of the pulp often extend to a height where they are easily involved. The object of making a broad outline at this portion of the step is to give great strength to the filling where strength is most needed. This point should be made very clear, as it is a common fault among operators to make a very narrow connection between the occlusal and proximal portions of the cavity. We must constantly bear in mind the properties of the material with which we are dealing. Amalgam is not a ductile material and continued heavy stress upon a small body of it will surely cause it to give way in time. The junction of the proximal and occlusal surfaces has often been proved to have insufficient strength; this strength can easily be increased by placing more material at this point, for the strength of amalgam increases rapidly as its bulk increases.

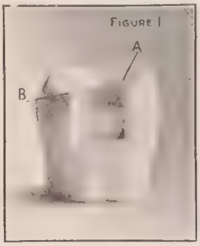


Fig. 1—Preparation of cavity in mesio-occlusal surfaces of an upper molar. The cavity is cut broad from A to B to give added strength against fracture or flow at this point.

Wherever decay has progressed throughout the dentin so that any cusp has been undermined and weakened, the cusp should always be cut away, at least one-third of the occluso-gingival diameter of the tooth, and restored with a bulk of amalgam.

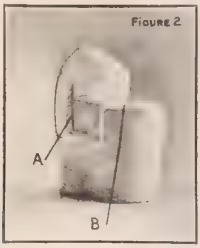
Very often decay has become extensive from both the mesial and distal surfaces and all the cusps are more or less undermined. In the majority of cases such teeth are condemned as impossible of restoration except with a banded crown. The writer seldom hesitates to restore such teeth with amalgam. Records of these extensive operations, covering a period of years, have yet to reveal the first failure, either from recurrence of decay, from fracture, or any other cause. The procedure for such restorations is shown in the following illustration:

Note that the gingival seats are extended to the same point as for an ordinary proximal cavity and the pulp cavity has been squared out and extended buccally and lingually as far as may be safely done. This is the retentive form and because of the large flat base it is amply sufficient. The cusps have been reduced about two-thirds of the depth of the crown to a very safe and immune area. The gingival form, when restored, is anatomically correct and remains free from that irritation which must result when a banded restoration is used.

The outline form of cavities, which occur upon the buccal, lingual, and occlusal surfaces, is identical with the form which is used for fillings of gold.

Resistance Form

The resistance form of the cavity should be the same for amalgam as for gold, namely, a flat gingival wall with definite angles, and a broad flat step or pulpal wall. The base of the cavity should be at right angles to the force of occlusion and usually at right angles to the long axis of the tooth.



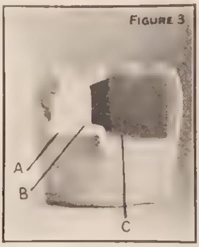


Fig. 2—Cavity involving the mesio-occluso-distal surfaces and lingual cusp of an upper bicuspid. Notice at A the bucco-axio-line angle is carried near the occlusal surface to act as a resistance against the flow of the amalgam from the cavity. B—represents the weakened lingual cusp cut away that it may be restored by a bulk of amalgam of sufficient volume to be resistant to the forces of occlusion.

Fig. 3—A very common form of cavity where extensive caries has destroyed the dentin supporting the disto-lingual cusp. A, is a countersunk slot through the wall which will act to prevent the movement of the bulk of amalgam at this point. B—the cusp reduced to strong and sound tissue preparatory to being restored. C—the tooth pulp having been removed and the pulp cavity lined with cement to prevent the amalgam from being forced into the pulp canals, such pulp cavities make secure retention when squared up, and will give better results than when filled with a mass of cement.

Retention Form

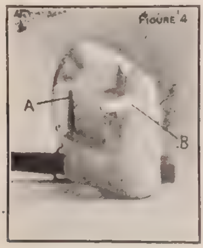
The ideal retention form is a box form—that is, a flat seat and a wall at right angles. This form gives the greatest possible strength to the lateral walls. If amalgam were properly condensed into a cavity of this kind, it would be safely retained. However, as we cannot always select such ideal cavities, we must take into consideration the conditions which actually occur.

As amalgam tends to flow under pressure, it is permissible, in compound cavities, to use more retention than is necessary for gold. This is accomplished by carrying the buccal and lingual axial lines, in a very slightly retentive form, to a point near the occlusal surface. This statement is not intended in any way to countenance deep or decided undercuts which may weaken the walls and subsequently permit fracture. These lines are carried out solely for the purpose of resisting the flow of the amalgam.

It is permissible to use the pulp chamber as an aid to retention to devitalized teeth. It gives added strength and a base which is better, stronger, and more stable than cement.

Convenience Form

Extension for convenience is not so essential as for gold. Usually, when the other forms of retention have been observed the convenience form is sufficient. It should, however, be observed that the proper condensing instruments will enter the cavity in lines which will produce convenient adaptation.



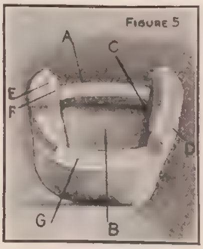


Fig. 4—Cavity preparation in a bicuspid involving the proximal and occlusal surfaces and part of the lingual cusp. A is an auxiliary resistance against flow. B shows a part of the lingual cusp cut away and beveled so that the amalgam will lock the wall and prevent fracture.

Fig. 5—Preparation of molar for large restoration involving all surfaces and cusps; such restorations are called amalgam crowns. A—The distal wall or "seat." G—The mesial wall or "seat." B—The pulpal wall enlarged almost to the dento-enamel to give additional retention, and to lock the amalgam as near the external surface of the tooth as possible, to reduce the amount of flow at the margins. C—The walls very slightly undercut for anchorage. The resistance form of this cavity is more than sufficient, because of the flat seat and the area involved, the forces acting against the restoration only tend to seat it more firmly. E-F shows a bevel from the cavity for added strength.

Removal of Carious Dentin

All carious dentin should be removed after completing the outline form, to avoid accidents to the pulp.

Finish of Enamel Walls.

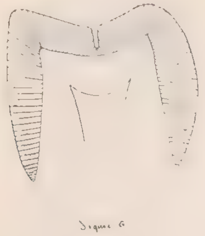
The direction of the enamel rods should be carefully studied.

It is of the greatest importance that all of the surface margins shall be at such an angle that no short, unsupported rods of enamel will remain at the surface. These are likely to become dislodged after the filling has been placed, causing an uneven surface for the lodgment of food solutions and resulting in subsequent failure of the operation.

In the preparation of the cavity, the enamel should be cut with the long axis of the rods. In finishing the cavo-enamel surface, a sharp, broad chisel should plane the entire enamel depth at an angle which will insure the absence of any short rods at the surface and the presence of as few as possible at the base of the enamel.

Thin margins of enamel are weak and should be avoided. We should so arrange the margins, which will be subject to the forces of occlusion, that they will form, as nearly as possible, a right angle. Doctor Black advocates, in the preparation of the cavo-surface angle for gold foil, that the bevel should be one-fourth of the depth of the enamel. This is entirely proper for gold but would be unsafe for amalgam.

It is a common, though mistaken, belief among the profession that enamel margins should not be beveled for amalgam. This is also dangerous. The enamel *should* be beveled and the cutting should be the entire depth of the enamel. The angle should be just sufficient to remove safely from the surface all short rods which might become fractured after the filling has been placed.



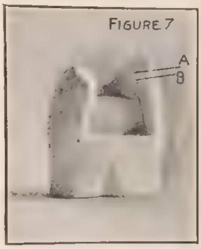


Fig. 6—This diagram illustrates the direction of the enamel rods in their relation to the pulp, dentin and surface of the tooth. It will be observed that any cavity wall near the central portion of the tooth does not require a strong bevel, that a planing of the wall is sufficient and will permit of the margin of the filling material being almost a right angle, which would be much stronger than an acute angle, as illustrated in Fig. 7.

Fig. 7—A to B shows a bevel of the enamel wall about one-fourth its depth, which is permissible for gold but not for amalgam. See Figs. 6 and 8.

Making a Cavity Toilet

The cavity toilet includes the final details, such as a thorough examination of every margin, surface, and angle with a low-power magnifying glass, and wiping or sweeping all of the cavity surfaces with cotton or spunk to remove fine particles of dust that cannot be removed in other ways.

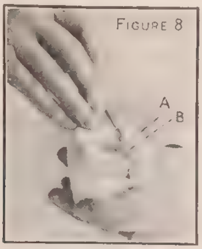
Matrices

While the use of the matrix is not, strictly speaking, a part of cavity preparation, it is of prime importance that, in all classes of cavities where one of the walls of the cavity is missing, some form of matrix shall be used to assist in forming the lost contour of the tooth and to aid in conforming the amalgam to the cavity.

The placing of matrices requires ingenuity and careful workmanship. There are numerous varieties on the market, some good, and all, perhaps, adaptable to certain conditions.

A perfect matrix must be of such form that it can be adapted, perfectly, to the gingival margin, yet not so closely that it will not permit the amalgam to adapt perfectly. It must have such rigidity of wall that it will not be forced out of position and permit the amalgam to "landslide" from the cavity and fail to condense well at the margins. It must be so arranged that perfect contact may be had against the approximating tooth, without loss of space. It must be such that it can be removed in a short period of time without distorting the filling. The matrix which most nearly meets all these requirements is the tied copper matrix.

These matrices are made from ordinary sheet copper, 36 gauge, which can be obtained from any supply house. The copper should first be annealed in the flame and then dipped in water two or three times to make it pliable. A strip should be cut which is long enough to pass sufficiently about the tooth and wide enough to extend somewhat beyond the length of the tooth so as to give the piece additional rigidity. It does not need to encircle the tooth entirely. Let it extend a little past the margins of the cavity, as far as it will without inconvenience, and mark the length desired, also the point where the contact should come. Remove and cut off at the desired length and, with the rubber dam punch, make a hole where the contact should come; then slit from the occlusal edge down to this hole. With pliers, turn up little ears at the gingival angles, so as to engage the ligature, and the matrix is ready to be placed upon the tooth and tied.



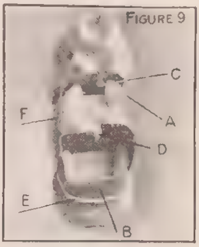


Fig. 8—Showing the chisel in position for beveling the enamel for amalgam. A-B—A very slight bevel but carried through the enamel as distinguished from A-B, Fig. 7.

Fig. 9—A illustrates the 36-gauge copper matrix in position. C-Hole punched through the matrix at the point of contact to permit the amalgam being condensed directly against the opposing tooth. B illustrates a full copper band in position for an amalgam crown. This method is more difficult than using seamless copper bands or soldering bands for the purpose. A space for contact should be provided the same as at C.

The flat floss, used for prophylactic work, is very convenient for tying these, or ordinary floss will do. Place the ligature once around the tooth and matrix and make a single knot, then pass one end of the ligature around the tooth so that is surrounds the tooth twice with only a single tie. Now the ligature should be held taut with one hand while, with an instrument, it is adjusted about the tooth and matrix and carried up above the gingival margin. If the opening for the contact is not in the proper place, it may be adjusted by drawing either end of the ligature.

Now tie it with the surgeon's knot and continue to wrap it about the tooth, tying mesially and distally until the form of the interproximal space is produced as desired. After the first tie, avoid making the matrix too tight; leave it so that some amalgam will be forced over the margins, as it will be found almost impossible to carry amalgam perfectly to the margins unless an excess is permitted to pass over them.

The amalgam should be packed in the cavity in the manner which will be described under "Manipulation and Instrumentation" in this article. As the amalgam is driven to position, it will pass through the hole punched in the matrix and will condense against the proximal surface of the opposing tooth at the position desired for contact. Heavy force on the amalgam and driving it through the opening in the matrix will produce separation of the teeth to some extent. If more separation than can be produced in this manner is desired, a separator should be placed between the teeth over the matrix in such a position that it will not impinge upon the margin of the cavity at any point and so prevent perfect adaptation of the amalgam.

If the outline of the cavity is extensive and involves to any extent the buccal and lingual walls, the matrix should be burnished to position and a roll of softened modeling compound pressed against it and extended mesially and distally against the other teeth. This, when hard, is easily held in position and will support the matrix against the force of heavy condensing.

As soon as the amalgam is resistant and can be carved, the excess should be carved away with suitable instruments and the ligatures cut and removed. Then, with heavy pliers, grasp one end of the matrix, while holding the opposite end firmly against the tooth, and tear with a twisting motion from the contact down to the gingival, and remove. The other section can be readily removed.

With this form of matrix there is no space lost for thickness of metal, and there is no occasion for disturbing the filling in its removal. It can be quickly and accurately applied, and, in cases where separation is desired, a separator can be placed over it and will adhere to the tooth.

II. ALLOYS

The second essential in standardizing amalgam work is the selection of the best alloy it is possible to obtain for the amalgam. The question which the writer hears most frequently is, "How are we to know the best alloy to use?" We believe that the best answer to this question will be found by considering those qualities which are essential to the best alloys. These essential qualities are as follows:

It must amalgamate, and be capable of good manipulation by men of average ability.

When properly amalgamated and packed in a cavity, it must remain tight to the cavity walls. That is, *it must not shrink*, and must show very little expansion.

Its amalgam must be sufficiently strong to withstand the continued force of mastication, without causing the mass to flow from the cavity, and its margins must stand this force without fracture.

It should dissolve in mercury of about equal weight.

It must contain only materials which will not injure the tissues or cause them to become discolored.

Its amalgam must resist the oral fluids.

It is an added advantage if the color is pleasing.

It is not an easy matter to incorporate all of these good qualities in one alloy, but it is possible and we should never be satisfied with any alloy which fails to meet all of these requirements. Some information as to how these alloys are made may be of interest

Dental Alloy Metals

The metals which have been used to any extent in dental alloys are silver, tin, copper, zinc, and gold. Many others have been tried but are not used to any extent.

Silver is the element of strength in all alloys. It increases in volume when amalgamated. It increases strength and lessens flow, and, because of its affinity for mercury when properly exposed, it hastens setting. It tarnishes in sulphuretted hydrogen and soluble sulphides. It causes the mass to work hard.

Tin unites with mercury in all proportions, forming a weak crystaline compound. It retards setting, decreases in volume when amalgamated, decreases edge strength, increases flow, and produces an easily worked mass.

Copper unites with mercury with great difficulty at ordinary temperatures. It increases the strength when not to exceed five per cent. is used, decreases flow, and does not contract or expand.

Zinc used in sufficient quantity, it is claimed, will aid amalgamation. Doctor Black, after years of careful observation of the effect of various modifying metals, says (Vol.II, page 312):

"Experiment in watching fillings for five years shows, also, that one-half per cent. of zinc is inadmissible, for the reason that the amalgam will continue to change bulk very slowly for that time and perhaps much longer. Though this change is not large (not more than one to one and one-half points per year with one per cent. of zinc), it will finally destroy the usefulness of the fillings. This effect was so subtle that it was not at first discovered."

Gold has never been found to add any desirable properties. It makes the amalgam springy and difficult to pack well.

Quoting again from Doctor Black (Vol. II, page 304):

"Great search had been made among the possible metals for amalgams and it had been very conclusively shown that alloys composed of silver and tin must serve as the basis of dental amalgams. Silver was the only metal found which would give the necessary rigidity and stability to amalgams, while the combination with tin alone could be depended upon to produce sufficient solubility of the silver in mercury. Other metals could be regarded only as modifiers, however important they might prove in that capacity."

Methods of Alloy Making

There are many methods of alloy making and many theories which make interesting literature, but we believe that, as yet, but one scientific procedure has been devised and that is the *balancing of opposing physical properties* of the alloy metals. This method is so well expressed by Dr. C. M. McCauley in a paper read before the National Dental Association and published in the *Dental Cosmos*, February, 1912, that we shall quote from it as follows:

"The third class of tests mentioned was introduced by Dr. G. V. Black. He took up the physical properties of amalgams one by one, ascertained definitely what produced every physical phenomenon contributing to good or evil results in alloys, and pointed out ways and means of correcting the vital faults appearing as he proceeded with his work. His plan was to devise instruments for measuring the movements of amalgams in setting, and to ascertain the strength of the final products. These instruments were scientifically built, and unquestionably work most accurately of any yet made for this purpose. His micrometer is so constructed that the slightest change in volume, expansion or contraction can be measured, even to the 1-20000 of an inch. With this instrument, minute measurements can be taken with the same degree of accuracy that the mechanic can measure the half-inch or the half-foot. Doctor Black also made a matrix with which fillings could be made of uniform size in the form of a cube. He also built the amalgam dynamometer with which he tested these small fillings (which were 85-1000 of an inch in size) for strength in pounds. To the dynamometer a small micrometer is attached, with a scale made of units of one thousandth of an inch. This instrument registers the flow under a given pressure within a given time. The binocular microscope was used to verify the work of the micrometer. In all cases where the micrometer indicates shrinkage or expansion in any marked degree, this microscope enables one to actually see the change which has taken place. Black's work throughout was of the most accurate and painstaking character, and, up to this date, no one has succeeded in disproving any of his conclusions. The results of the following experiments, which were made in Doctor Black's laboratory, conform in every point with his conclusions, and only tend to emphasize their accuracy.

"*Experiments*

"*Weighing of Metals*—The metals used in each melting were carefully proportioned and weighed to the accuracy of 1-64th of a grain. The amount made up each time varied from 10 to 30 grams, depending upon the different tests desired.

"*Alloying*—The following is Doctor Black's latest statement regarding the alloying process:

" 'An alloy is a solution of one metal in another metal, or of several metals in each other. This solution is similar in its nature to the solution of common salt in water. To properly form an alloy, this solution must be complete. That is, every individual cubic centimeter of the salt water, or of the alloy formed, represents the same percentage of its ingredients as the whole of the body of which it is a part.

" 'The alloying of metals must be done in the molten state. Time and agitation enter into the question of complete solution. Yet a high-fusing metal may often be dissolved in a lower-fusing metal without raising the temperature more than a few degrees higher than the melting point of the alloy formed. This is done best in the closed crucible in an atmosphere of hydrogen, to prevent oxidation.

" 'The metals enter into solution, one with another, or several together, in all proportions, only some differences in readiness of solution being noted. In this solution there seems to be no question of chemical union of the metals.

" 'The formation of eutecticons in alloys of metals, when overheated, is a frequent occurrence. In this, two or more alloys are formed in the mass, differing in the percentage of the metals contained, and in the fusing points. To the ordinary observer, this may be seen by remelting the alloy, under favorable conditions for observation, and closely observing its behavior. If there are no eutecticons, all of the mass will melt at one degree of heat. If there are eutecticons, the lower-fusing alloy will become fluid at a certain degree of heat. The particles of the higher-fusing alloy will be afloat in this, but not melted. This may be so abundant as to give the metal a doughy consistency at this stage; then a higher degree of heat is necessary to melt this higher-fusing alloy and render the melt complete. The condition of the metal when between the two melting-points will vary as the lower and higher melting portions differ in abundance. Dentists in using die and counter-die metals observe this condition often in the alloys that have been melted many times.

" 'A precisely similar thing occurs in solutions of salt in water, when cooled several degrees below the ordinary freezing point of water. A portion of water will freeze. This frozen portion is found to have only a comparatively low percentage of salt, while the remaining mother liquor is richer in salt.

" 'There is no other use of alloys in which attention to all of these details in forming them is so important as for amalgam-making. Any change in the alloy from the perfect result changes its relation to mercury; and especially any failure in obtaining a perfect solution of each metal in the other, or leaving some portion as a mixture instead of a solution, so changes its relation to mercury as to destroy that perfect balance of metals on which the accuracy of results depends.'

"Unless the factor of perfect alloying is carefully observed, the ingot will not be of uniform proportions throughout, and the fillings cut therefrom would not be of uniform proportions and physical properties. Care must also be used to prevent waste by oxidation during the heating process, because, the slightest difference in degree of oxidation in the metals would change the proportions which have been so carefully weighed before beginning, and in dental alloy making the proper proportioning of metals means very much indeed. Oxidation was prevented in these tests by using a closed electric crucible with a gas pipe fitted in the top, through which hydrogen was permitted to flow during the melting process. The gas drives out the oxygen and flows over the surface of the metals during heating. The heating device consisted of two rheostats so connected that the current could be controlled so as to pass by sixteen steps from the melting-point of tin to the melting-point of gold, thus permitting of more gradual heating. This apparatus, after a little practice, will enable one to judge very closely the proper degree of heat to be used each time for procuring a perfect alloy, yet not so high as to disturb the balance in the metals by the divisions known as eutecticons.

"*Filing and Annealing*—After pouring and cooling the ingot, the filing is done slowly to prevent heating by friction. The alloy is next sifted through a fine sieve to remove the larger fragments, and a magnet is passed through the filings to remove small particles of steel. One-half the filings are then placed in a bottle and labeled 'Fresh-cut,' and test fillings are immediately made therewith. The rest of the filings are annealed.

"*Aging of Alloys*—It has long been known that alloys undergo a change with age. Different reasons have been advanced for this change. Some still believe that it is caused by oxidation of the filings of alloy from exposure to the atmosphere. This is an error. Doctor Black has proved beyond any question that this change is produced entirely by heat. The degree of the aging is dependent upon the degree of heat and the length of time. Exposure to the air produces no change unless heat is present. In the same way agitation in the bottle produces no change, unless heat is present. Inasmuch as heat proved to be the only factor in this change, Doctor Black termed it simply tempering or annealing of metals. All commercial alloys must be annealed before being placed on the market in order to render their physical properties as permanent as possible. A fresh cut alloy, which will make a good amalgam immediately after cutting, will show marked shrinkage after a few months. If the alloy is fully annealed, the maximum shrinkage will occur at once, and no further movement will appear. If the alloy is partly annealed, only part of the shrinkage is overcome, and age will continue to change the alloy until it is fully annealed. Many tests for determining the degree and time of heat for proper annealing have been made, and it has been determined that shrinkage decreases, as the filings are heated in boiling water, up to fifteen minutes. Longer boiling does not produce more shrinkage, but it will cause slower setting and less strength in the amalgam. The stage of annealing at which no further shrinkage appears Doctor Black has termed the 'zero point' of annealing. A balanced formula annealed to this point is rather quick setting; if the alloy is annealed beyond this point, setting is effected more slowly; therefore, any first-class alloy must be quicksetting.

"After alloys are correctly annealed, time or age continues the process of weakening or softening. The best alloys to be had will finally grow so old standing on the shelf or in the cabinet that their utility will be destroyed. Alloys should never be used after one year from the time of cutting and annealing. Our only means of protection in this respect is to refuse to accept a package of alloy unless the date of manufacture is plainly stamped thereon. Slow setting is an evidence of overaging; also the percentage of mercury required diminishes as the age of the alloy advances.

"*Tests*

"The series of silver-tin tests selected for this work was begun with 40 per cent. silver and 60 per cent. tin and the silver scale was advanced 5 per cent. at each melting. Thus the amount of silver increased 5 per cent, each time, while the tin decreased 5 per cent. This series was to determine the proportion of these two metals which would produce the greatest number of desirable and the smallest number of faulty physical properties.

"*Expansion and Shrinkage*—Liquid metals possess the property of changing their volume when passing into the solid state. Some expand and others shrink. In the case of silver and tin, the one expands and the other contracts. The object of this test was to locate the precise place on the scale where the expansion of silver will overcome the shrinkage of tin and produce an immovable mass. It has been stated that aging or annealing causes shrinkage, hence it became necessary to make tests both of fresh-cut and annealed alloy from each melting. A filling of each was made in the Wedelstædt tube after the formula of 40 per cent. silver and 60 per cent. tin, measured in the micrometer and recorded. These tubes were measured again every few hours at first, and once a day after two days. Both fillings showed shrinkage, which indicated a need of more silver. Fillings were next made from an alloy of the formula 45 silver, 55 tin. Shrinkage was still present, but was seen to be a trifle less than before. This advance on the silver scale of five per cent. at each melting was maintained until the formula 65:35 was tested. At this point, shrinkage in the fresh-cut disappeared, but the filling made of the annealed alloy shrank eight points. Around this point on the scale a good alloy could be made if used fresh cut. Fresh-cut alloy being impracticable, on account of age producing shrinkage, unless used the same day it is cut, further search was made for the point of no shrinkage or expansion in the annealed alloy, or the point of balance, as we shall hereafter term it, Going up the scale five per cent. each time, leaving out the report of the record of the fresh-cut alloy, at 75:25, shrinkage had ceased and expansion appeared. Going back to the formula 70:30, shrinkage at 5½-10000ths of an inch was noted. It now seemed evident that the balance point lay somewhere between 70 per cent. and 75 per cent. of silver. A filling of alloy of the formula 72½:27½ was made, and slight shrinkage was still noted. I now determined to go up the scale one-half of one per cent. each time, carefully testing all the way, until the balance was reached. The shrinkage gradually disappeared, growing a little less each time one-half of one per cent. of silver was added. At 74 per cent. silver, 1-10000th of an inch, or one point, of shrinkage appeared. At 74½ percent. of silver, no shrinkage occurred, but instead a half-point, or 1-20000th of an inch, of expansion occurred. The precise balance lies between these two points, 74 and 74½, but as a half-point of expansion is rather to be desired, this formula of 74½:25½, when found to remain unchanged in the cavity for ten days, was recorded.

"Doctor Black has said that no set formula can be relied upon because of the different degrees of fineness existing in the commercial metals. To determine the accuracy of this conclusion, I procured some more metals from a different source, and made a number of fillings, ranging in proportions of silver both above and below the formula already found, these fillings differing from one another in the amount of silver by one-half of one per cent. In the case of metals No. 2, the formula established for metals No. 1 showed shrinkage of one point, and the balance was located at 75 per cent. silver, 25 per cent. tin. In a third lot of metals I found the balance point at 74 percent. silver.

"This point of balance has been found as low as 72½ silver by Doctor Black. It may readily be seen that any set formula adopted between 72½ silver and 75 silver might be very good or might be very bad. Hence, as Doctor Black has formerly concluded, the only scientific method of arriving at correct proportions consists in working out the balance in the manner indicated above, and securing a separate formula for each lot of metals procured from the market. Even a silver shortage of one-half of one per cent. will allow shrinkage sufficient to destroy the utility of a filling, regardless of the degree of skill used in placing the filling in the tooth.

"To be accurate, the 1 10000th of an inch in the movement of a filling may ruin the filling. If the balance point is missed by one-half of one per cent. in the proportion of the metals, this degree of inaccuracy will be produced. Hence, in order to obtain a perfect filling, the alloy must be scientifically balanced. There is no other known way of finding the balance point in alloys of metals except that discovered by Doctor Black, which requires very close measuring, together with the most accurate technic in making the alloys. Therefore, we may conclude that the alloy-maker, however skillful he may be, cannot make a scientific alloy without the aid of such instruments as will detect the slightest movement in an amalgam while setting.

"The maker who still uses the test of time as his guide is groping in the dark. His work is all done by guess, and is bearing such fruit as is seen in the failing of all amalgam fillings for which his alloys are used. The practice of following a set formula in manufacturing an alloy is pernicious, and should not be tolerated by the dental profession.

"The effect of the shrinkage of amalgam fillings is discoloration and recurrence of caries.

"Shrinkage of one point, as shown by the micrometer measurement, may produce a ditch between the filling and the cavity wall as wide as 1–10000th of an inch. The micro-organism which produces caries measures from four-tenths to eight-tenths of a micron, the micron being 1–1000th of a millimeter, or 1–25000th of an inch. Therefore, the micro-organism measures from 1–65000th to 1–32500th of an inch, and a few figures will reveal the fact that one point of shrinkage will open up a passage sufficiently large to admit from three to six of these offenders, side by side.

"Even less than one point of shrinkage will admit micro-organisms, and caries may begin again where the cavity margins cross a susceptible area. The question therefore arises as to what should be done with the vast number of commercial amalgams which shrink from 1 to 15 and even 20 points."

There is a great variation in the ability of dentists to work different alloys. Many insist upon using alloys which are "easy" to manipulate. It is well known that those alloys which are regarded as easy to manipulate are such that they cannot produce the best results. On the other hand, it is not best to use an alloy which sets so rapidly that it is beyond the ability of the operator to get perfect results. The best alloys *must* be rather quick setting, but it is possible so to regulate their setting qualities that any operator can use them.

The extremely rapid setting alloys usually require a high percentage of mercury to make them sufficiently plastic to permit good manipulation, but large percentages of mercury should not be encouraged.

(*To be continued*)

Keep your courage hot, no matter what else gets cold. And courage is just the doing of difficult things when they are to be done, and doing them well.

CONDUCTIVE ANESTHESIA*

BY CARL D. LUCAS, D.D.S., INDIANAPOLIS, INDIANA

WITHIN THE LAST TEN YEARS many new scientific attainments have been achieved in the dental profession which have practically precluded the possibility of the general practitioner keeping abreast of the times in all the avenues of his chosen profession. At least four specialties have been developed; and we feel sure that as our profession continues to advance, new specialties shall be developed in this great field of science.

In fact, dentistry as a true science has been advanced to that status within the last ten years, and the pioneers are indeed deserving of an enormous amount of credit for their untiring efforts which have made it possible for the rapid strides in the science as well as the art of dentistry.

Conductive anesthesia, or sensory nerve blocking, is possibly the last, and to the writer's mind, the best evidence of scientific progress in operative dental technic which has been perfected since the profession has been established upon a firm scientific foundation, and recognized as a science by the medical profession.

John B. Deaver, of Philadelphia, advocated and used this means as long ago as 1898 for neuralgia of the fifth nerve, using cocain in alcohol.

By the employment of this technic, the operator is enabled to accomplish each operation to the best of his knowledge of what should be a perfect result.

This subject was chosen not because it is unfamiliar to the members of this society, but rather to impress the fact that we should thoroughly understand the principles of asepsis and become more familiar with the anatomy of the parts upon which we are called to operate.

Asepsis is, and by all means should be, the keynote in all dental operations, and especially should we at all times keep before our mind's eye this word, and closely follow its precepts in each application of conductive anesthesia. No man should attempt to employ this great adjunct to scientific attainment in his routine of work unless he expects to approach as nearly as possible to surgical cleanliness in every operation.

If he will follow the rules of asepsis and acquire a definite knowledge of the anatomy of the fifth cranial nerve, his success is assured.

PREPARATION OF ANESTHETIC

Novocain .02 with synthetic or chemically prepared suprarenin hydrochlorid .00005 in an isotonic saline solution is an ideal anesthetic for our purpose.

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*Read before the "Wabash Valley Dental Society" Wabash, Indiana.

Novocain-suprarenin tablets E, may be obtained, each containing novocain .02, suprarenin hydrochlorid synthetic .00005, which are most convenient for use.

There is a tablet called "Ringer Tablet," which contains sodium chlorid 0.5, calcium chlorid 0.04, potassium chlorid 0.02, to be dissolved in freshly distilled water (100.00). One Ringer tablet dissolved by boiling in 10 c. c. distilled water makes an isotonic physiologic saline solution, which makes an ideal vehicle for carrying the novocain-suprarenin compound.

This Ringer solution should be prepared fresh for use each day and kept as a stock solution for the compounding of the anesthetic.

One novocain-suprarenin tablet E, dissolved by boiling in 1 c. c. or sixteen drops of Ringer solution, makes a 2% novocain, 1-1000 of 1% suprarenin hydrochlorid isotonic solution, which is considered the proper strength for injection.

Jena glass dissolving cups graduated in cubic centimeters should be used for dissolving the tablets. The Hoechst-Farbwerke Company has these cups on the market, one holding 10 c. c. for use in compounding Ringer solution and one 3 c. c. for dissolving the novocain tablets in Ringer solution.

It is absolutely necessary for the anesthetic to be neutral in chemical reaction, therefore the German Jena glass receptacles should be used on account of the solubility of American glass. American glass has alkaline salts incorporated in it and these salts being soluble, thereby render the injection slightly alkaline in reaction if American glass containers be used.

Freshly distilled water should always be used in making up the Ringer stock solution, and each operator should have a still incorporated in his instrumentarium. Upon investigation we find the Silverman Jena glass still to be the most convenient and economical upon the market.

The Ringer stock solution should be kept in a Jena glass container, called the Ringer Flask, which may be obtained from the Consolidated Dental Mfg. Co., Chicago.

An injection syringe designed by Dr. Guido Fischer is ideal for this work, and when not in use should be kept suspended by a German silver, nickel or gold plated stand in a Jena glass jar containing a solution of alcohol 75%, glycerin 25%, or 70% alcohol.

Upon removing the syringe from the alcohol-glycerin bath, the syringe with needle attached should be thoroughly washed out by drawing boiling distilled water from an evaporating dish into the syringe and expressing it three or four times to remove all traces of the alcohol-glycerin solution.

The distilled water used for rinsing the syringe should not be returned to the evaporating dish on account of traces of alcohol which are in the syringe.

After the syringe has been washed out as above indicated, the anesthetic solution, which is prepared by bringing to the boiling point one E tablet per c. c. of Ringer stock solution, may be drawn into the syringe.

Iridio-platinum hypodermic needles should be used, and before drawing the solution into the syringe, the needle should be heated to a cherry red for further sterilization, and all air expelled from the barrel of the syringe.

PREPARATION OF FIELD

The mouth should be thoroughly sprayed with some antiseptic solution and the point of the injection thoroughly scrubbed with a solution of iodin and aconite, equal parts. The iodin sterilizes the field and the aconite slightly anesthetizes the mucous membrane for the insertion of the needle. Iodin does practically no good when used on any moist area, therefore dry the area before using the iodin-aconite mixture.

SUBMUCOUS ANESTHESIA

For the preparation of a single cavity, extirpation of a pulp, or the extraction of any upper tooth to the third molar, where no pathogenic condition exists, conductive anesthesia is contraindicated. Submucous, or peripheral anesthesia should be employed as follows:

Sterilize the mucous membrane upon the labial or buccal side of the root of the tooth to be operated, with the iodin-aconite solution. Insert the short No. 17 needle, almost at right angle to the long axis, midway between the cervix and apex of the root of the tooth to be anesthetized; bevel side toward the bone, into the gum tissue to the process. Deposit a drop or two of the solution and lower the syringe until the needle will be about parallel with the long axis of the tooth, then gently advance the needle to a point corresponding to the apical plane of the root. As the needle is being advanced the tissues should be gradually infiltrated. After the apical region is reached, deposit one c. c. of the solution slowly, continuously massaging the tissue, thereby infiltrating the area. After a lapse of five to ten minutes, proceed to operate.

The upper molars may be anesthetized in this manner, but in some cases a lingual injection should be made, infiltrating the gum upon the lingual side of the roots, thereby anesthetizing the peripheral nerves which enter the sockets of the lingual roots. Complete anesthetization for about one hour will result.

INFRAORBITAL NERVE-BLOCKING

If a pathologic condition of the upper central lateral incisor or cuspid exists, submucous anesthesia is contraindicated and conductive anesthesia becomes the procedure of choice.

These six anterior teeth receive their nerve supply from the anterior superior dental branches of the infraorbital division of the superior maxillary division of the fifth nerve. These branches are given off before the infraorbital nerve terminals emerge upon the facial surface of the superior maxillary bone at the infraorbital foramen. They pass downward in special canals within the substance of the upper maxillary bone to the sockets of the central, and lateral incisors and cuspid teeth.

The infraorbital foramen is located about 1 c.m. below the center of the infraorbital ridge. This anatomical point should be located by the palpating (index) finger of the left hand, the lip everted with the thumb of the left hand, and the mucous membrane over the apex of the root of the upper first bicuspid sterilized with the iodin-aconite solution. Insert the long needle, No. 17C., bevel side toward the bone, at the labio-gingival junction of the mucous membrane, and deposit a small amount of the solution. Gently insert the needle through the tissues in the canine fossa until its point is felt under the palpating finger at the infraorbital foramen. Compress the point of the needle toward the foramen with the finger and deposit one c. c. of the solution, thereby forcing the solution through the foramen. This technic will block off the nerve supply to these teeth within ten minutes, lasting from one-half to one hour.

CONDUCTIVE ANESTHESIA FOR UPPER MOLARS AND BICUSPIDS

These teeth receive their nerve supply from the superior maxillary division of the fifth cranial nerve. The middle superior dental branches to the bicuspids and the posterior superior dental branches to the molars.

The posterior superior dental branches are given off from the infraorbital division of the superior maxillary nerve just before it enters the infraorbital groove. They pass downward in the posterior dental grooves, upon the posterior or zygomatic surface of the superior maxillary bone and enter special canals within the body of the superior maxillary bone, through the posterior dental foramina, which are situated about one-half c.m. above the apices of the roots of the upper third molar.

The middle superior dental branches are given off anteriorly to the posterior superior dental branches, after the infraorbital nerve enters the infraorbital groove in the floor of the orbital cavity. They pass downward through special canals within the substance of the superior maxillary bone to the bicuspids, anastomosing with the anterior superior dental divisions. Frequently they are given off before the infraorbital groove is reached and pass downward in the posterior dental grooves to the posterior, or middle superior dental foramina where they enter special canals within the substance of the bone, passing forward to the bicuspid sockets.

To block the nerve supply to these teeth, palpate the base of the molar process of the superior maxillary bone, sterilize the mucous membrane at the apices of the buccal roots of the upper first and second molar teeth with the iodin-aconite solution and insert the long needle (No. 17C.), bevel side toward the bone, over the center of the nail of the palpating index finger, into the mucous membrane upon the distal side of the molar process. The needle should be directed upward and backward at an angle of about 45 degrees to the occlusal plane of the upper molars. Slowly infiltrate the tissues as the needle is advanced to about three-fourths of its length; then, by slightly withdrawing and reinserting the needle, slowly infiltrate the tissues in the vicinity of the posterior superior dental foramina with two c.c. of the solution. Within ten minutes the molars and usually the bicuspids will become anesthetized for cavity preparation or pulp extirpation. The period of anesthetization is from one-half to one hour.

Occasionally it is necessary to block the posterior superior dental branches and also the anterior superior dental branches to anesthetize the bicuspids, on account of the middle superior dental branches being given off from the infraorbital nerve in the infraorbital groove and the anastomosis of these branches with the anterior superior dental divisions.

For the painless extraction of these teeth it becomes necessary to make an injection, infiltrating the tissues in the region of the posterior palatine foramen, thereby blocking the anterior palatine division of the descending palatine nerve from Meckel's ganglion.

Sterilize the mucous membrane with iodin-aconite solution upon lingual side of upper second and third molars. Insert the long needle (No. 17C.) into the gum tissue upon lingual side of the lingual root of the upper second molar, midway between apex and cervix, and pass the needle to the depth of one c.m. upward and backward at an angle of 45 degrees to the upper occlusal plane and deposit one-half c. c. of the solution.

This injection should immediately follow the posterior superior dental injection for producing surgical anesthesia.

MAXILLARY SINUS

For the evacuation of pus from the maxillary sinus in empyema, the posterior superior dental, anterior superior dental, and also a submucous injection in the canine fossa should be made. Thereby the antral branches which innervate the mucosa of the sinus will be blocked, facilitating a window resection in the canine fossa.

LOWER TEETH

All of the lower teeth receive nerve supply from branches of the inferior dental, the largest division of the fifth nerve, which is given off from the lower side of the Gasserian ganglion, passes downward through the foramen ovale, between the internal pterygoid muscle and the body of the ascending ramus, to the inferior dental or mandibular foramen, which is situated about the center of the lingual side of the body of the ramus. The terminal branches of this nerve trunk are the mental, which emerge through the mental foramen below the bicuspids; and the incisive branches, running forward from the mental foramen within the body of the inferior maxilla to supply the cuspid, lateral and central incisors.

To block the nerve supply to all the lower teeth, one injection will usually suffice.

With the index finger of the left hand, palpate the external oblique line, distal to the last tooth below. Pass the ball of the finger lingually into the retromolar fossa between the external and internal oblique line, flex the anterior phalanx of the palpating finger until the nail rests upon the internal oblique line. Slightly withdraw the finger and sterilize the mucous membrane with the iodin-aconite solution. Place the palpating finger in the position as above indicated and with the barrel of the syringe over the crowns of the cuspid and first bicuspid of the opposite side of the jaw, insert the long needle (No. 17C.), bevel side toward the bone, over the center of the nail, into the tissue about one c.m. above the occlusal plane of the molars. Inject a few drops and gradually advance the needle to the depth of two c.m. always keeping the bevel side of the needle point against the bone. Slightly withdraw and reinsert the needle as two c.c. of the solution are being injected, thereby infiltrating the tissues in the region of the mandibular foramen within the mandibular sulcus.

Within from ten to twenty minutes the nerve supply to the pulps and pericemental membrane of all the lower teeth upon that side will be blocked.

For the extraction of the lower molars it is often necessary to make an injection of one c.c. of the solution upon the buccal side of the process of the lower third molar to block the buccal branch of the facial or seventh nerve.

Anesthetization will ensue for from one-half to two hours after these two injections.

MENTAL INJECTION

For extraction or perforation into pulp-chamber of an abscessed lower central, or lateral incisor, cuspid, first or second bicuspid, the incisive branches which are given off from the inferior dental nerve before it emerges at the mental foramen, should be blocked as follows:

Evert the lower lip and sterilize the mucous membrane at the labio-gingival junction below the lower first and second bicuspids with the iodin-aconite solution. Puncture the mucous membrane at this point with the long needle (No. 17C.), bevel side toward the bone, and pass the needle downward to within one c.m. of the lower border of the body of the bone until the needle point is felt under the tip of the palpating index finger of the left hand. Exert pressure with the finger upon the needle point and inject one c.c. of the solution. After ten minutes the incisive branches will be blocked, remaining so for a period of thirty minutes to one hour.

The writer has been successful in blocking the naso-palatine, descending palatine, and accessory palatine branches from Meckel's ganglion, for rhinologists in the removal of tonsils, turbinate bones, and submucous resection of the nasal septum.

The technic is as follows, for each or either side:

Palpate the base of the molar process of the superior maxillary bone. Sterilize the mucous membrane with the iodin-aconite solution, distal to this process.

The long needle (No. 17C.), mounted upon the long curved shank should be inserted one c.m. distally to the distal side of the malar process, in a vertical direction to its full length, or to a point corresponding to the center of the zygomatic arch, into the spheno maxillary fossa. Two c.c. of the solution are slowly injected here, thereby blocking the descending naso palatine and anterior palatine branches from Meckel's ganglion. After ten to fifteen minutes the rhinologist is able to operate upon the tonsil or turbinate bones, or to do a submucous resection without pain; the anesthetic effect lasting from one to two hours.

A thorough appreciation and application of the principles of surgical cleanliness, comprehensive understanding of the anatomy of the parts, which should be gained by dissection if possible, and practical demonstrations of the technic, are the prime requisites for success in this comparatively new field of humanitarian endeavor.

If you are willing to go into this work upon a sane, scientific basis, not becoming so enthusiastic in its employment that you lose sight of the fact that the patient's nervous equilibrium may become too severely taxed in certain severe oral surgical procedures, where general anesthetics are unquestionably indicated, you will feel that your practice of dentistry has become a source of great pleasure to yourself and your clientele.

ORAL HYGIENE REPORT*

BY G. C. BOWLES, D.D.S., DETROIT, MICH.

FROM SEVENTY-FIVE TO NINETY PER CENT. of the children of school age are in need of dental care. If these dental defects had no influence on the health, development, and efficiency of the children the suffering alone should move us to do what we can to mitigate it. Experience has shown that in the great majority of cases when parents learn their children are suffering from unhygienic mouth conditions they are ready to make every sacrifice to provide for them all necessary care.

The trouble is that but comparatively few parents realize that the teeth of the younger children require any care other than extraction when a toothache becomes unusually prolonged or severe.

The fault is not with the parents but with us. We know the cumulative effect upon the digestive system of food habitually bolted because sensitive cavities prevent proper chewing. We know the baneful effects of putrescent pulps and pus absorption. We see the havoc neglect works to the first permanent molars, and the wrecked occlusion resulting from preventable conditions of the deciduous teeth. But the parents do not and it is the part of the dental profession to see to it that they are informed. And it is the duty of the dentists of every community to see to it that poverty shall not cause any child present suffering or permanent handicap for the want of dental care.

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*Read before the Michigan State Dental Association 1915.

Dental inspection by dentists could be had in the schools in every city, town and village in Michigan if the dentists were alive to their obligations, and would cast aside petty jealousies and go to work systematically to obtain it.

The pioneer work has already been done. It is only necessary to show the authorities of any community the benefits arising to the children when dental inspection is in vogue, to obtain permission to put it into practice. There is no more effective means of educating both parents and children than the reports received from the school dental inspector. In the villages and smaller cities the dentists could well afford to give their services for a semi-annual dental inspection of the school children. The good resulting would be out of all proportion to the sacrifice required. In the larger cities a few dental clinics to care for those children who otherwise would suffer, uncared-for, almost inevitably follows in the wake of dental inspection. And with very little effort an enthusiastic, informed dentist could raise among the public spirited people of any community enough money to fully equip such a clinic. It does not have to be elaborate. The dental supply men are very generous in such a cause.

A second-hand chair and engine cost about $60.00. Instruments and supplies were bought at wholesale. A considerable number of good forceps and other instruments were contributed from the "junk" piles of different dentists.

The clinic was operated on Saturdays, by volunteers, for two school years. The third year an operator was paid (by money contributed by the local dental society) to give every Saturday to the work. He was assisted by volunteers, another chair being added. This is about as long as a voluntary clinic is likely to run smoothly. With continued demands for service the volunteers thin out, although it is the universal verdict of everyone who gave his services to the cause that the work was a real pleasure and that it abundantly repaid for the sacrifice of valuable time. By the end of the third year the clinic had become absolutely indispensable to school and health authorities. Petitions endorsing the work and recommending that the city take it over were circulated and signed by almost everyone to whom they were shown. These were presented to the city council where the recommendation was adopted. The circulation of these petitions which were signed by thousands of people had in it an unexpected educational value.

Under the Detroit Board of Health the clinics were increased to three and systematic dental inspection by dentists was established. The second year the clinics were increased to eight with eleven operators and six dental inspectors. This year 1914-15 there are twelve clinics, fifteen chairs and twenty operators. The seven dental examiners are now examining the oral conditions of the pupils for the second time this school year and approximately 95,000 examinations have been made.

Detroit's experience is here retold that you may know that if you believe in the need you can start a similar work in your home town. The need is there whether you believe it or not and some day, and that not far distant, the public will awake to the fact that you have been dead or indifferent to the community interest. Do not wait for some live man to move to your town and show up your selfishness and inertia. Do what conscience dictates as your plain duty and do it at once. If the Oral Hygiene Committee can aid you in any way, call upon it; it was organized for that purpose.

Of seven Michigan cities known to be active, or contemplating activity in the Oral Hygiene Campaign, four replied to the request for a report as to programs.

Jackson sent the following concise and explicit statement from which it will be seen that the development there was similar to that of Detroit:

> Jackson is no doubt the leading city of its size in the state, in its dental hygiene and oral prophylaxis campaign, and the establishment of a free dental dispensary for poor children.
>
> This agitation and its consequent accomplishments are due to the active work and co-operation of the local dental society, whose members contributed their services in the free clinic for a period of three years. The great amount of good resulting from this movement was so convincing that the school board took over the work and now employs a dentist in the department of hygiene.
>
> One-half day of each school week is now given to this work, which is much too short a time to cover the great number of cases needing attention. For the coming school year we hope to have at least one entire day for the work.
>
> The benefits consequent upon this work can only be appreciated by the dentist, who sees the children from year to year. At first sitting, each child is given a tooth brush and a tube of dental paste, and is fully drilled in the use of same, and the child once instructed along the lines of oral prophylaxis will usually carry out the teachings when it realizes the results.
>
> The following is a report covering operations performed during the first semester, September 14 to December 24, 1914, inclusive:

Number of different children treated	37
Amalgam Fillings	58
Copper Cement	8
Zinc Cement	5
Temporary Fillings	13
Permanent teeth extracted	1
Temporary teeth extracted	24
Teeth treated, root canals filled	9
Cleanings	18

Yours very truly,
Paul L. Gardner
School Dentist

Muskegon replied as follows:

> I put in two mornings a week (six hours) at our clinic. We start in at the beginning of the school year and examine all the school children and send notices to the parents telling

them the condition of their child's teeth and mouth. While we are making the examinations the school nurse, who works with me, the principals of the different schools, and the attending officer are investigating cases for the clinic so that when we have finished our examinations we have quite a number of deserving children on our list for the clinic. These cases are all carefully investigated to guard against imposters and I believe we have very few of them. We have some cases where the people do not depend upon charity for their living but to whom a large dental bill would be a calamity and these are really the most satisfactory patients.

Last year we examined over four thousand children, treated one hundred sixty-five, extracted one hundred fifty-seven teeth, treated forty-seven, filled nine hundred ten and cleaned one hundred fourteen sets.

When you consider that we have done the above work with one dentist and one nurse in two hundred forty hours I believe you will agree that we have been busy, but we expect to do more this year and will be glad to send you a report when the year is over, if you desire it.

I am enclosing all the different blanks we use in connection with the clinic.

Yours very truly,

Frank J. Quinn.

Grand Rapids replied that nothing new had developed since last year's report but that it was hoped in the near future the service being rendered at the present school clinic would be increased and that the work would be extended along broader lines.

Port Huron has been planning for dental inspection in the schools and possibly for a free clinic some time, but I am sorry to report that nothing tangible has yet developed.

Europe is learning at very great cost that sober soldiers are more efficient than drunken or partially drunken ones. Part of Europe, at least, is also learning at great cost that neglect of its citizens' teeth is seriously crippling the endurance and the effectiveness of its army.

The campaign for a sober race of civilians in this country is well under way. Let every member of this society do his part for a healthier, happier and more enduring race by furthering the educational campaign for the general and intelligent application of the principles of Oral Hygiene.

We found in Detroit that in connection with this work for the school children, public sentiment was very strongly with us, and I believe that would be true anywhere in the state. We took the matter up with the business men, and I myself obtained about a thousand signatures to the petitions. I started from my office and went down Woodward Avenue. I found only one man who refused to sign my list. In some places, where a large number of people were employed, I was asked to leave the list for a day or so, and I would get that list back with perhaps a hundred names added to it.

I have recently learned that they have started inspection in one school in Port Huron. I feel that it won't end with one school, it will embrace them all. Then the demand for a free dental clinic will be insistently made, and some of the Port Huron men will have to sacrifice some of their time for a year or so in giving free service. After that the school board will take the work over. That is the inevitable result, because once it is shown that the children are being handicapped by lack of dental care, and that their efficiency all through life depends to a great extent upon their care during childhood, once the public knows that, the result is inevitable.

THE PRESIDENT: You have heard this splendid report of Doctor Bowles. This is a subject that I believe has never been given enough time on our program. We should go into this oral hygiene work on our programs on a larger scale. But when we get reports of this character, we feel that our work is being properly carried on.

DISCUSSION

DR. A. C. THOMPSON: I have thoroughly enjoyed the Doctor's paper and his review of what has been done. I want to supplement it as far as my own district is concerned. The dentists in Port Huron are not only willing but glad to undertake this work. We have endeavored to do so for several years. We have had some conditions there perhaps peculiarly our own, in that we met with opposition at first from the Board of Education and even from the Superintendent of schools. This year we asked to be permitted to make examinations, and received permission to examine one school which we have accomplished. In that school we found over ninety per cent. of the children required dental attention. We have been giving free dental attention for several years in this way: the principals of the schools have been notified that they are at liberty to send a card with any pupil in need of dental attention and not able to pay for it, and we have been taking care of them in our offices. Last year the Board of Education appointed a special school nurse. In some ways that helped us, and in some ways it was a drawback, because when we asked permission to make examinations, the board replied that they had provided this nurse, and why not let her do it? Every dentist in Port Huron is willing to donate some time on Saturday morning and we have been doing this in our offices, which is not the best way; I venture to say that two-thirds of the offices in Port Huron during the past winter have been taking care of cases sent to them by the school nurse Saturday mornings.

We are planning in Port Huron for what is known as "Good Health Week" under the direction of the State Board of Health, and yesterday the Superintendent of schools asked me if we couldn't present an evening's program consisting of a lecture on and demonstration of what is being done, and what should be done. We are expecting some assistance from outside in the way of slides, etc., to help with this work. I want to assure you that in the Seventh District we recognize the need of this kind of work, and are anxious to do it.

How is the inspection conducted in Jackson, Dr. Howlett?

THE SECRETARY: Through the school nurse. We took it up with the Board of Health, and then went to the School Board, and they employed a school nurse, and she does all the inspecting, with the school physician. We haven't a school dentist, but hope later to get one. The nurse works with the superintendent of clinics.

DR. HARRY D. WATSON: I want to supplement Dr. Bowles' report on the Grand Rapids situation. The last time he received a report from the committee, we were lying down on the job. Our man, who is now a paid man, in the clinic, has more than he can do. He has so much to do that he cannot take care of any temporary teeth at all, except to relieve suffering, and at the last meeting of the Holmes Dental Club, our local organization here, we were assured that when we could show the need of another operator, the board of health, under whose supervision the arrangement now is, would provide another man. We have obtained permission of the Superintendent of schools to go through one of the West Side schools, which is a representative one, from the first grade up to the eighth, and we are going to make the examinations there. If we find, as we undoubtedly will, from seventy to ninety per cent. needing dental attention, we are going to place the situation before the council and the board of health, and expect shortly to have an operator on the West Side. The West Side is not as large as the East Side, but the need there is probably greater than on the East Side, because it is a poorer community. We have a fine new South End high school, and that has been equipped with a room to be used as a dental infirmary. That shows the attitude of the school board and the architects and the whole city toward that thing, and I believe Grand Rapids is going to the front in dental clinic work. There are many children here who cannot get dental care. A couple of days ago one of the district nurses called me up, and wanted to know if I couldn't care for a young girl who had a lot of dental work to be done, and which could not be done in the clinic, and I told her I would be glad to take care of it. We, the E. S. Holmes Dental Club, conducted this clinic voluntarily for two years, but the operator is under salary now, and we expect to make rapid progress.

Dr. Bowles: I am very glad to have these added words. I am sure that if the men at Port Huron would show what has been shown in New York City, where a very careful investigation was made, and where it was shown that this lack of dental care cost New York City $800,000 a year, because it was demonstrated conclusively that it required six months longer for children with defective teeth to get through the eight grades in school, that that would bring results. That extra semester costs for each pupil about $20, and where there are 500, or 5,000, or 10,000, costing $20 each, you can see what a saving would result to the parents and to the city if the children's teeth were properly cared for. I suppose you have received a reprint from a British paper, in which is shown the enormous cost to the rate payers of England for the care of its tuberculosis subjects. Half of that expense they estimate would be saved had those subjects received proper dental care. Now that condition prevails everywhere. It is an economic problem. It would cost the community less to take care of the teeth of its children than it costs it later through their loss in efficiency. Figures presented in this way are very persuasive. It is of course a good thing to have inspection by a dental nurse, if you cannot have it by a dentist, but few dental nurses are capable of recognizing gingivitis or pyorrhea in their early stages, or malocclusion or dental abscesses, etc. They can tell when the teeth are broken down that there are cavities present, but whether they are capable of detecting many pathologic conditions recognizable by the dentist is an open question. When we brought the matter up in Detroit, the health authorities wanted the inspection work done by the medical inspectors, but we felt they weren't capable of making a dental examination. What we should work toward is dental inspectors, for while the ordinary school nurse or medical examiner might recognize glaring defects, dental examination should include the idea of prevention and the training of the school nurse or medical examiner does not fit them for this class of service.

REMOVAL OF PYORRHEA DEPOSITS*

BY T. P. HINMAN, ATLANTA, GEORGIA

This is a demonstration of the technic of removal of pyorrhetic deposits from the teeth, using pushcut scalers. The subsequent medication of teeth so treated is the application of the iodine creosote preparation, applied to the border of the gum, immediately followed by an application of glyceride of tannin, thus sealing the pockets so that food particles or infection cannot be forced into the freshly cut areas. I believe in non-medication, the use of normal salt solution is the only wash to use in subsequent treatment, plus the use daily of citrate of sodium, with which the teeth are brushed, to prevent a redeposition.

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*Clinic Kentucky State Dental Society, 1914.

THE DENTIST AND THE INDUSTRIAL COMMISSION OF OHIO

BY DR. A. C. MINOR, CINCINNATI, OHIO

IN OHIO WE HAVE an Industrial Commission about which most every dentist is familiar. We come in contact with this commission, as a rule, only when we fill out the commission's "Surgeon's Fee Bill," issued by the department of claims. This, after we have attended the necessary dental wants of the injured workman.

Dentists must realize that workmen as a class do not or cannot patronize the more highly paid practitioner. I believe the ruling of the commission in taking the average fees of the average dentist with a patronage among working people principally, as a basis of award, to be fair. The ordinary workman is not so esthetic as practical about his dental work. The practitioner whose ordinary prices are more than the general run of workmen can pay, should refer the industrial patient to a dentist who will or does work at the prices the commission approves.

I had a case whose lawyer (a patient of mine) sent him to me. The amount of work reasonably required to restore his mouth, at my prices, would have cost the commission $97.50. Wondering whether the commission would allow only the fee for a plate instead of the bridge work which I proposed to do, or probably lessen my award, I sought information. From the agency in Cincinnati I secured their bulletin. Under the title of "Problems of Medical Aid as it Applies to Dentists", I found that bridge work was allowable, which settled one difficulty. I also found that my fee would be cut to $80.00 and that I ran the risk of satisfying the Commission that the work I put in for my claim was necessary. I saw that the fee of the dentist was at the mercy, so to speak, of the commission. I thought it wise to call in two fellow practitioners to examine the mouth that I might have their support in any controversy that might arise about this mouth. Then I thought of another plan and offered it to the Department of Claims at Columbus as a suggestion.

My letter and answer I present here. It may guide a few in their operations upon those men coming under the provisions of this Industrial Act of Ohio.

Cincinnati, Ohio, Jan. 25, 1915

Industrial Commission of Ohio.

Gentlemen: In your Bulletin, Vol. I, No. 6, page 36, describing and considering the replacement of injured teeth with bridge work, I would think it highly advisable that the dentist operating on the patient, with a claim before your commission, take a wax impression of the mouth at the beginning of the work and from this wax impression draw models which he should send to you at your headquarters. At the completion of his work, let him also take another impression from which he obtains models showing the completed operation, explaining exactly as it will the amount and extent as well as the character of the work for which he wants pay by your commission. This will prove very valuable to the dentist of conscientious tendencies, as it will prove his case before your commission, and it will prevent any unscrupulous practitioner from imposing on the commission.

I offer this only as a suggestion as you are in a new field of endeavor, as far as this state is concerned, and as it occurs to me since I have a claimant with considerable bridge work to do, and I was a little dubious about your commission taking a large amount of work of this class without protest. A model before and after the operation would obviate contention on either side concerning dental services rendered, especially where bridge or plate work is performed. These models are of no material value, and the expense would be so very slight that no dentist would refuse to prepare them for you in order to prove his claim. In another sense the patient would appreciate some such positive indentification or chart, to prove to you that he or she was not trying to impose on you. In bridge work a model showing roots still in where they have been broken, say by accident, would be better than a smooth model showing entirely healed gums. I suggest this not to supplant, but to supplement, your present chart system.

Pardon me if I intrude upon your private opinions; I merely offer an idea that might be valuable for justice to the commission, the dentist, and the claimant (injured). In my opinion, also, the amount approved for dental splints for fractures is too small.

Very truly yours,
A. C. Minor

Columbus, Jan. 27, 1915

Dr. Ancel C. Minor,
716 Mercantile Library Bldg., 414 Walnut St., Cincinnati, O.

My dear Doctor:

Your letter received and we wish to compliment you on your suggestions and to assure you that we appreciate them very much indeed. We believe your ideas to be the best that we have found yet and would ask if you could inform us of a dental journal which probably most the dentists of the state take. We would further ask your opinion as to whether you do not believe that an article written by you, brief and to the point, would be of much value if placed in a dental journal and with the approval of the Commission that we believe the procedure described by you to be ideal and that it would obviate any question as to the amount of work made necessary by an accident.

Again we wish to thank you for your opinion and assure you we would be glad of any further ideas that you may have in this respect. Our idea of dental splints (and we are free to admit that this is an item to which we have not given a great deal of thought) is that a dental splint by itself is not the most ideal form of treatment, as a rule, but is probably best used in conjunction with an outside splint. Further, you should remember that the amount approved for the splint, as stated in the bulletin, is for the splint and its first application only. If we are correct in our assumption, most of these splints have to be removed occasionally and cleaned, so that a dentist would probably have charges for after-attention. A reasonable amount for this after-attention would be approved.

With best wishes, I am
Very fraternally yours,
A. W. Binckley,
Chief Medical Examiner

WHY THEY FAILED

BY L. P. HASKELL, CHICAGO

THEY FAILED simply because they attempted the impossible, and this was true of seven dentists, because they allowed the patient to dictate, by insisting upon the retention of certain teeth. It is an interesting history, and one to profit by.

Fifteen years ago a patient from a distant city came to me for an upper denture, as she had tried several dentists without satisfactory results.

I found conditions favorable and had no difficulty in the construction of a continuous gum denture, which was needed because she showed the gums.

For ten years she sang my praises. When the denture was made she had in the lower jaw the anterior teeth and all bicuspids, providing sufficient support for the dentures, but would not consent to wear a plate for more masticating surface.

Ten years later she returned for a new set. The second bicuspid on one side had become loose and was extracted and the first had loosened, and had but a slight hold on the upper tooth. On the opposite side the teeth had decayed and had been crowned. She had lost two incisors and a bridge had been inserted to replace them.

Realizing the difficulty of making a successful upper denture, with such frail support on one side, and loose at that, I thought it possible one or two additional teeth might be added to the bridge, and sent her to a noted bridge worker, who said it was not advisable. So I proceeded to construct a new denture, which for a while I said might be satisfactory, but did not guarantee satisfactory results; as the bridge she wore was uncomfortable this dentist made a new one and still refused a partial plate.

On her way home she dropped her teeth and they were badly broken.

A year later she returned for repair or make over as she had lost one of the left bicuspids, and the remaining one would be worse than useless when the loose left-one was extracted I advised her to have them extracted and a plate inserted. She refused the extraction and I would not attach a plate to the loose tooth so turned her over to a dentist to do it. This was a failure of course. The loose root was swinging in all directions. I was simply disgusted and had she not come so far would positively have refused to work for her, but made the attempt, telling her what would result.

The lower plate she had was unsatisfactory, but I told her it was foolish to attempt to remedy the condition and that I would not make a new lower plate, so placed her in the hands of another dentist for a new one, but it was not satisfactory and could not be, so some friend recommended her to a dentist, and he had no better success.

She still was obstinate and would not take my advice, so foolishly, instead of sending her away, I attempted the upper case again, and for the time being, was satisfied although I told her what the result would be, sooner or later, and she left.

A year later I was in her city and canvassed the whole matter and she seemed convinced that I was right. A year later she offered to pay my expenses, and pay for reconstruction, so I went there, laboring under the greatest difficulty in doing work in a strange place and without proper appliances, etc.

But the worst of it all, she had not taken my advice, but three dentists had attempted again the impossible and of course failed. One sued her, and in her absence obtained judgment.

In each case I had no difficulty with the uppers and getting adhesion, but the trouble remained. For the time being it worked, but the swinging loose tooth played the mischief. She paid my bill and two years later died. She must have paid more than a thousand dollars, and put seven dentists in two cities to great annoyance and failure, and yet they were to blame for *attempting the impossible*.

TANTALUM AND ITS USES

BY CHARLES M. BALDWIN, D.D.S., TOLEDO, OHIO

REPEATED QUESTIONS AND STATEMENTS show that many dentists lack information concerning the comparatively new metal, tantalum, that has been used increasingly during the last few years, or misunderstand its properties.

A newspaper article entitled "Harder Than Diamonds" recently made the following statement: "Just how hard it (tantalum) is may be imagined when it is mentioned that a thin sheet of it was placed under a diamond drill, working day and night for three days. The only effect was a slight indentation in the tantalum and the wearing out of the diamond." Other equally erroneous claims were made. If newspapers only were guilty of such mistakes, professional men very properly might ignore them.

One of the best informed dentists has stated that pure tantalum was hard enough to resist a diamond drill for days, and that tantalum instruments, used in silicate work, must be some alloy of the metal, because they could be cut with a sharp file.

Almost all of the information about the properties and production of tantalum given herein has been derived from the Siemens & Halske Co., Berlin, Germany, the only manufacturers of tantalum dental instruments, and all other tantalum articles, but principally filaments for electric lamps.

In 1801 the oxide of a new metal was found by Hatchett, in a black mineral from the British museum. He called the metal "Columbium," and the mineral "Columbite." In 1802 Eckeberg found the same metal in Finland and Sweden. The oxide proved to be quite insoluble in the ordinary reagents, and being reminded of the Greek Tantalus Myth, Eckeberg named the metal tantalum.

For several decades it remained a chemical curiosity, until "in 1824 Berzelius obtained metal tantalum in the form of an infusible black powder, by heating potassium tantalum fluoride with metallic potassium in an iron crucible and washing the resulting mass with water and dilute alcohol. The product so obtained was *very impure* containing barely 60% of metal."

"In 1902 Moissan succeeded in preparing tantalum electro-chemically by reduction of tantalic acid with charcoal in the electric furnace.

In 1903 Dr. W. V. Bolton, during his researches at the electric lamp factory of The Siemens & Halske Co., overcame the difficulties of preparing *pure* tantalum.

Tantaliferous rock occurs in all quarters of the globe; it is found in large quantities in America and Australia, and it also occurs in Europe. Tantaliferous minerals, which mainly were obtained as a valueless by-product in tin mines, formerly were thrown on the rubbish heap until the demand from The Siemens & Halske Co. drew attention of mine owners to their valuable character.

Webster states that tantalum is "a non-metallic element found in various rare minerals, as columbite, tantalite, samarskite and ferqusonite, usually with columbium. It is isolated as a dark gray powder or as a very hard, steel gray, metallic-looking substance.

The Siemens & Halske Co. use tantalic acid from the tantalum ores which, by chemical treatment, is converted into a white double salt, potassium tantalum fluoride, $K_2F_2T_aF_5$. The pure metal tantalum is obtained by melting this fluoride salt in an electric *vacuum* furnace at very high temperatures. "The metal is then so pure that practically no appreciable impurities of any kind whatever can be detected in it."

According to the latest determinations the melting point of pure tantalum is about 5018 degrees F., while platinum melts at 3390 degrees F., and tungsten at 5432 degrees F.

The atomic weight of tantalum is given as 181.80, while the specific gravity is 16.6. The pure metal is exceptionally ductile, flexible and very tough, and, with some exceptions, may be worked by the methods usually employed for other metals. "Its tensile strength is very great, amounting to 58 tons per square inch."

The *normal hardness of pure tantalum* is equal to that of medium hard steel. The erroneous statements of its excessive hardness were based upon the early preparations which contained oxide and proportionately is always harder but less ductile than pure tantalum.

Tantalum is absolutely anti-magnetic, and like the noble metals, is unaffected by exposure to air at ordinary temperatures. It resists the action of all alkalies and acids at all temperatures, with the single exception of hydrofluoric acid, but molten alkalies cause it to disintegrate into separate crystals.

Possessing so many valuable qualities it is rather surprising that it can not be soldered in the usual way.

At a comparatively low heat its surface becomes yellow, blue at 750 degrees F., grayish black at 1,100 degrees F., and at higher temperatures a white layer of tantalum oxide forms and gradually burns.

In a vacuum tantalum can be heated to the highest white heat. Its largest use has been in electric lamps, where it was used as the first all-metal filament in 1903. A few years later a Cleveland company was the first to use tungsten wire for this purpose.

Metals such as silver, copper, platinum, zinc, nickel and antimony can be deposited perfectly on tantalum, which will enlarge its use electrically. Coated with platinum, tantalum pins can be baked in teeth and used for many purposes where otherwise oxidation in air at high temperatures would prevent its use.

All the instruments are hardened by a special process which changes the original bright grayish white surface to a dark blue-black color. Tantalum does not rust and may be sterilized by boiling in acids or by holding in the flame until a moderate red heat develops, which hardens rather than softens it.

The spring temper of instruments permits them to bend under heavy pressure, but they will not break unless bent repeatedly or excessively.

The extreme handicap in using silicate cements with non-metallic instruments was entirely removed when tantalum instruments were found to be free from the objections known to exist with all other metal instruments. Tantalum instruments will be found valuable in silicate cement work in proportion as thin or small forms are needed. The tantalum spatula seldom is used in silicate work, as there is a slight chance of discoloration from excessive spatulation, but there would be no oxidation of the minute particles, hence little if any discoloration of the filling. However, a tantalum spatula is not needed.

Instruments should be placed in water as soon after using as possible to prevent cements from hardening on them, making it unnecessary to scratch them with files, disks or stones.

Tantalum instruments have been found valuable for burnishing crystal forms of gold in cavities instead of condensing the gold by malleting.

Pliers and needles of tantalum are used to carry and apply drugs, including tricresol and iodin, as none of them attack the metal. Other forms of instruments made for dental use are special small spatulas, smooth and barbed broaches, root canal drills, disks, saws, arches for orthodontia work, injection needles, etc.

Whether or not we believe in the law of the Survival of the Fittest, we are just that, and must continually strive to remain the fittest if we would continue to survive.

HEALTH CONSERVATION

ORAL HYGIENE*

BY WM. W. BELCHER, D.D.S., ROCHESTER, N. Y.

THERE CAN BE NO DIFFERENCE of opinion as to the value of dental attention to the growing child. Better he leave school with sound body and a partially developed brain than be a college graduate at twenty with a mouth resembling a burnt district, and an impaired digestive system. Knowledge can be acquired even late in life but not a new body.

This tide of dental decay in the mouths of our school children can be traced back to but one place, viz., the first five grades in our school system both in public or parochial. Different observers in every part of the civilized world unite in asserting that this, a universal affliction, is found in 75% to 98% of all children.

In the beginning of our interest in the oral hygiene movement, the one thing most desired was the establishment of a free dental dispensary for the treatment of children of the worthy poor. We had thought to teach prophylaxis and make exhaustive data as to the value of the work as a factor in school instruction.

Soon the dispensaries were filled with children suffering dental ills and the dentist in charge busy with patients he could not properly attend to, patching up a lot of troubles that refused to stay patched. He had no time or inclination to impart instructions on mouth hygiene or preventive dentistry. Restrictions and investigations were necessary that only those most worthy and with the smallest incomes should receive attention.

The child in a family of small income is most often a recently arrived immigrant from Russia or Southern Europe. This is a "free country" and they gladly accept everything in sight that isn't nailed. This is true even when well off in this world's goods; it is a mark of cunning to deceive, the only disgrace is in being found out.

Beginning with complete treatment of each worthy applicant for free dental services, every important center is replacing restrictions on the amount of such services and to whom rendered. Dr. Albin Lenhardtson, Stockholm, Sweden, in a paper read before the Fourth International School Hygiene Congress at Buffalo last year, recommended that the first complete treatment of a child's mouth be free, and subsequent annual examinations and services rendered to be at the expense of the parents. His reasons were that in the majority of cases, treatment was caused by neglect of hygienic precautions and it was the duty of the parents to instruct and admonish children in that respect. It was too much to ask the community to pay for this neglect.

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*Read before the West Virginia State Dental Society, 1914.

In England, a radical theory of extraction has lately been propounded. All teeth in a child's mouth that cannot be easily filled and those lacking antagonists are to be extracted. This has met with general acceptance, the conclusions being based on weighing of the children before and after such a radical cleansing of the mouth. It is claimed the child suffers less from the inability to masticate than from the septic conditions of the mouth.

Very little is gained by applying hygienic measures to the mouths of only a part of the children in a class—we must give treatment to all. This also is justice to the tax payer. The Socialistic party is a factor to be reckoned with. In their State platform adopted at Rochester, N.Y. this year, they demand free dental dispensaries for all school children.

The condition of the worthy poor in our large cities is most deplorable. They live miserably and know not why. They see their children grow up in ignorance and evil. The street is their only place of recreation and before they are able to work, necessity compels them to become wage earners. They work sore and gain nothing. This is the essence of poverty.

Many believe the provisions of charity at the present day are so generous and varied, that no one need suffer. Even if this were true, it would not materially lessen the sorrows of the worthy poor. To thousands and thousands of workingmen, the dread of public pauperism is the agony of their lives; they hate charity as the Devil is supposed to hate Holy Water. Constantly on the brink that divides poverty from pauperism they will suffer almost anything rather than accept charity. You cannot reach these people with a free dispensary; they will have none of it.

Under the present order of things, the children receiving services in our dental dispensaries are not taught to do for themselves. We value things as we pay for them. The child having received his dentistry free, naturally drifts to the advertising parlors as soon as he earns a wage, always supposing he has been sufficiently impressed with its value. The advertiser is furnishing most of the publicity in the press. His fees are low, he promises much and to one who has never paid for dental services his charges seem more than enough.

We must make our dental dispensaries more democratic. Services must be rendered to all as part of the regular school work. Our dental dispensaries must be more educational. They must be more effective.

It is useless to attempt by repair methods to stem the tide of decay in the mouths of our school children. We haven't dentists enough in the country to do a part of this work, and once done it must be attended to regularly.

What are we to do? The solution of this problem is prevention—the teaching of oral prophylaxis. There must be a dental dispensary in every school in the land.

When all children are treated in our schools and the stigma of charity is removed from such instructions and attention, the dental dispensary will be as popular and its services received by the self respecting poor as they now accept manual training, domestic science or gymnastics.

In this new dispensary of the future we will extract temporary teeth that are pus factors as the lesser of evils if the patient is unable to employ a dentist. Make examinations and relieve suffering? Yes, by all means. But give also thorough instructions on the care of the mouth. Demonstrate to each child how to properly use a brush. After a thorough prophylactic treatment, present or sell them a supply of dentifrice. See that they have a toothbrush. Insist that they bring it with them and mark with their name or initials. Give or sell them one at two cents if they are unable to pay more and charge to the municipality. It can't make a better investment. Have them return and clean their teeth in your presence.

Follow this up with printed instructions to the mothers as coming from the Board of Education. Present illustrated lectures when possible, to the scholars and the mothers, aye, even the fathers. Work for books on hygiene in which the care and anatomy of the teeth are interestingly presented. If you can't do this, print inserts of one page or more and place in the school books. Secure the co-operation of the school system and give each child a weekly mark of merit or demerit for the proper care of the mouth. In case of persistent inattention have the teacher take the offender under her arm and scrub the teeth of the culprit as an example to the rest of the class. In this way we may hope for permanent results.

But we can't do all this work of oral prophylaxis alone. In the first place there aren't dentists enough and again it will be too expensive. We must have the assistance of the trained dental hygienist. In the city of Bridgeport, Conn., the past year Dr. A. C. Fones, with the help of a number of self-sacrificing members of the profession and laymen, organized a school of dental hygienists with 30 young ladies in attendance who completed the course. A book is also in preparation containing these lectures to serve as a textbook for the future instructions. Part of the class has been reserved for a purely prophylactic dental dispensary in the Bridgeport public schools. The sum of $5,000 has been appropriated by the city fathers for this purpose. This is the first scientific attempt to prevent caries in a wholesale manner.

WHAT WOULD ALL THIS COST?

That's a question you must be able to answer to your taxpayers and your Board of Education. The amount is so pitifully small, I hesitate to mention it for fear you will not believe me.

I figure that with the $5,000 the city fathers have appropriated for the work in Bridgeport, when thoroughly organized, every child of school age can receive prophylactic treatment and instruction. I have not been in touch with Doctor Fones in this matter and I regret that I cannot present his figures for the expenditure of the money.

Bridgeport is about 100,000 poulation and you understand the first cost of equipment must come out of the sum named.

Here is the estimated cost of annual attention of 20,000 children, a larger number than will be treated at Bridgeport:

Annual salary of Dental operator and superintendent	$1,500.00
Four lady Dental Hygienists, $750 each	3,000.00
Laundry, materials, instruments and depreciation	500.00
Total	$5,000.00

Cost of equipment would be about $2,000.00; this would be only the first year. You must understand that comparatively few instruments would be necessary and the cost of materials would be nominal. Electric engines, chairs, fountain spittoons, all could be purchased for $2,000.00.

Now we have the cost of equipment and decided on the annual expense, let us determine what we can do. This is the outcome:

Dentist and four assistants average 16 children, or 80 receiving services daily. Figuring 250 school days in the year we find a total of 20,000 children at an expense of $0.25 each.*

The cost of educating a child in our public schools varies in different locations from $25 to $40 per year. This prophylactic dental dispensary would add 25 cents to each pupil to these school taxes.

In smaller units the expense would be more. Accept this fact and let us double the amount. West Virginia has about 1,500,000 population. If we figure one in five as attending school, it would make a total of 300,000 scholars; this at 50 cents each would make an annual expense of $150,000, added to a total of $9,000,000, if figured at $30 annual cost per child. I regret that I did not have time to ascertain your total school population or the annual expense per child. The figures as given must be approximately correct.

The best thing remains to be told. It wouldn't cost the State a cent—it would save money. The increased efficiency of its school children would make it an economy. Every time a child is set back in school it costs somebody money. All over the land we are paying for these "repeaters" as they are called and a large part of this unnecessary expense is because children are handicapped from receiving the instructions carefully planned.

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* The number of school days would be nearer 200 and this would add to the expense. If three prophylactic treatments were given during the year to each child, the per capita expense would be about one dollar. The expense of a small reparative clinic would also be necessary. If portable outfits were used as at Bridgeport, the cost of equipment would be materially reduced. It comes hard, but every once in a while I have to acknowledge that I am not infallible. (Author's note).

What use to provide expensive buildings and equipment and a trained teaching force to a child suffering from toothache, an impaired digestion, poorly nourished body or the numberless reflex troubles that may accompany an uncared-for mouth! This will apply with equal force to other physical handicaps, eyes, ears, nose and throat. We think the care of the teeth most important as they aggravate these conditions, and sometimes cause them. But do not let us get chesty when presenting these things, especially to the laymen. Oral hygiene is only a part of the general school hygiene of the future, whose best asset will be a healthy body, a healthy child free of physical ills in his school work.

A FEW IDEAS IN CROWN AND BRIDGE WORK*

BY W. E. GOEPPER

First mount on articulator the crowns as they are in the mouth. Next set up in black wax which vulcanite teeth come in and grind facings to the exact shape and size wanted, and set up in the black wax exactly as wanted when bridge is finished. On outside surface of articulator put some separating medium, and flood some quick-setting plaster over the surface of the facing. Next take out the black wax, and from the lingual side, with thumb, using modeling compound, press into place and bite down with the other half of articulator. Next carve up cusp. After cusp is carved up, remove the plaster originally placed on the buccal surface or labial surface as the case may be. Next remove facings and carved cusp from the articulator and grease the surface of the cusp with soap or some separating medium, make a little pile of plaster on a piece of paper and insert the occlusal surface of your carved cusp in the plaster. Next trim plaster down to desired height of your cusp and the plaster is ready to be mounted on the dentalac in swager. You now have a reproduction on the swager of the carved cusp on the articulator. Burnish down well with 36-gauge pure gold and swage. Next, place the facings and the modeling compound cusps on the articulator, and burnish the occlusal surface down snug, biting down with the other half of articulator and sticking the cusp to the other half of the articulator, then opening it up. Your cusps are now on the opposite half of articulator, which, when the articulator is closed, will come back into right position. Now remove modeling compound, carve cusp, insert facings in the plaster that has been run on the buccal or labial surface, and bite down with the other half of articulator. Stick wax the cusp crowns and facings. The bridge is now ready for investment.

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*Clinic Kentucky State Dental Society, 1914.

EDITORIAL

An Interesting Survey

Members of the Central Ohio Dental Society, a component of the State Dental Society and comprising seven counties, finding that there was a wide variance in fees and other conditions existing in their section of the State, decided to make a survey of conditions with the idea of placing the practice of dentistry on a more equable basis.

The survey committee framed a list of questions relating to conditions in general and fees in particular. The members were requested to answer questions correctly or not at all, and not to sign their names. From a membership of fifty-four there were thirty-one replies.

The survey showed that for every kind of operative work some members were charging only one-half, one-third, one-fourth and even one-fifth of what others were charging. In prosthetic dentistry, one-half, two-thirds, three-fourths. With the summary of the survey as a basis, the committee made a minimum fee schedule which was later adopted by the society.

The survey showed the average yearly income for the past five years to be \$2,500. Expenses including office rent, at an average of \$11.00 per month, general office expense, cost of supplies, at 16½ per cent. interest on investment and equipment, amounted to \$936, leaving an average net yearly income of \$1,564, out of a practice amounting to \$2,500.

Since this subject was brought before the society, November 1913, many members have been raising their fees. They declare that they seldom have a "kick." One member stated in July, 1914, that he had received \$300 more than he would have received for the same amount of work the year previous.

Here are a few of the general questions asked: Have you an assistant? 8 yes; 22 no. Is dentistry hard on your health? 21 yes; 7 no. Do you think physicians readily recognize alveolar abscess? 3 yes; 25 no. Do you consider that your skill and the value of your services have increased since you began practice? 30 yes. Do you charge the same fees you did at first? 3 yes; 27 no. Do you think you get the fees you should for your services? 2 yes; 22 no; 6 partly. Should we charge for examinations? 20 yes; 8 no. Do you own property? 16 yes; 14 no. Do you own an automobile? 6 yes; 24 no. Would you like to have the State Dental

Society make a survey similar to this? 28 yes; 1 no. Would you grasp opportunity to get out of dentistry into some other business? [illegible] yes; [illegible]

It would be interesting to have the State Society make a similar survey, for it would point out the true conditions existing throughout the state, and if state societies in other states would do likewise, it would do more than anything previously undertaken to show the real condition of dental practice throughout the United States. It would also indicate a remedy for deficiencies that might exist in any sections. It seems as though this is a matter of such importance that it should at least receive consideration from our state organization.

For the Love of Mike, Read This

E. X. Crowley, D. D. S.,
Lincoln, Neb.

Dear Doctor: Enclosed please find check for $5.00, amount of my national, state and district dues for 1915. Always glad to pay them.

Yours fraternally,
M. O. Johnson,
Crete, Neb.

Editor's Note—Ofcourse, he sent the money to the wrong man. But, suffering kicks, by all that's slow, by the gods of never-pay, look at those last five words, "always glad to pay them." Presidents, secretaries, of the districts and state, take off your head-piece and bow to Johnson. He's glad. One sweet flower, one ray of sunshine, a word of cheer have you this day sent. On the part of the Nebraska State Dental Society I take the liberty of thanking you for those kind words. We can't have too much of this kind of Johnson. Yes the world is getting better, and it's the Johnson kind that's doing it.—*Nebraska Dental Journal.*

New Dentists

When the new dentist comes to your town, welcome him. You cannot keep him out. Would it not be better for all concerned if you and he were good friends? He will probably be a recent graduate, full of hopes, many of them doomed to disappointment, little reverses and failures are liable to discourage him. The loss of a few patients may be sufficient to make him want to become an unethical man. Be charitable, lend him a helping hand by giving him an occasional word of encouragement. There will probably be practice enough for him, too, and if there should not be, he will be the one to realize it first and move to some other place, *if you are keeping yourself up-to-date.*

E. H. Bruening, in *Nebraska Dental Journal*

SOCIETY ANNOUNCEMENTS

F. D. I.

The next meeting of the International Dental Federation will be held September 2-3, 1915, at San Francisco, California.

Headquarters will be at The Clift Hotel.

Truman W. Brophy, *Pres.*
Burton Lee Thorpe, *Asst Sec.*,
3605 Lindell Blvd., St. Louis, Mo.

Panama Pacific Dental Congress

The Committee of Organization of the Panama Pacific Dental Congress desires to call the attention of the members of the dental profession to the fact that the Congress will convene on time in San Francisco, on August 30th, under most favorable conditions for holding a large and successful meeting.

The program of papers and clinics is almost complete and covers in a most comprehensive manner practically every subject pertaining to the practice of dentistry and oral surgery. About one hundred papers and two hundred and fifty clinics, or more, will be presented. Among the leading essayists and clinicians will be Truman W. Brophy, H. S. Dunning, M. H. Cryer, C. H. Oakman, Rudolph Weiser, Vienna, Austria; A. B. Bear, T. B. Hartzell, H. M. Sherman, T. E. Carmody, W. H. G. Logan, H. P. Carlton, Prof. Bornsdorff of Finland; E. F. Leffler, Garrett Newkirk, Herbert L. Wheeler, Louis Ottofy, Guy S. Millberry, M. L. Ward, I. N. Broomell, H. E. Friesell, V. A. Latham, F. B. Noyes, Josef Novitsky, C. H. Wilson, F. W. Hergert, C. J. R. Engstrom, V. E. Mitchell, Hart J. Goslee, J. Leon Williams, Alfred P. Rogers, A. H. Ketcham, E. L. Stanton, Weston A. Price, Louis Subirana of Madrid, Spain; R. Ottolengui, M. L. Rhein, H. A. Pullen, Vincenzo Guerini, of Italy; Joseph Nalin, of Montreal; W. H. Fitzgerald, Chas. McManus, C. O. Simpson, M. J. Congdon, R. B. Giffen, W. H. G. Chappel, Th. Weber, of Finland; A. G. Wherry, John V. Conzett, F. W. Gethro, Edwin R. Kibler, Richard H. Riethmuller, T. Sidney Smith, Robin Adair, H. Page Bailey, Wm. A. Capon, L. P. Haskell, Jules J. Sarrazin, V. H. Jackson, W. H. O. McGehee, Arthur C. Peck, E. A. Bogue, and many others.

As far as possible, no night sessions of the Congress will be held, leaving the evenings free for entertainment and the Exposition.

Over 1200 front feet of space will be occupied by the leading dealers and manufacturers of the world with one of the most comprehensive exhibits of dental and pharmaceutical goods ever shown.

All the sessions of the Congress, the meetings of the sections, component societies and the exhibits, will be held under one roof, in the Municipal Auditorium, one of the most magnificent structures of its kind, affording every opportunity for the effective and comfortable presentation of the program.

The Committee of Organization is sparing neither time, labor nor money to make the Congress the most notable event of its kind in the history of dentistry. To have missed it will be the regret of a lifetime. Transportation and Hotel accommodations will be within the reach of all, and should be secured at once. Over 1000 applications for membership are now on file with the Committee. Those who have not filed their application should do so now, so that arrangements may be made for their accommodation and entertainment.

No one interested in the history, progress and practice of dental science can afford to miss this great opportunity to attend the congress and at the same time visit the greatest International Exposition the world has ever seen.

Examination of Dentists for the U. S. Army

The Surgeon General of the Army announces that examinations for the appointment of Acting Dental Surgeons will be held at Fort Slocum, New York; Columbus Barracks, Ohio; Jefferson Barracks, Missouri; Fort Logan, Colorado; and Fort McDowell, California, on Monday, October 18, 1915.

Application blanks and full information concerning these examinations can be procured by addressing the "Surgeon General, U. S. Army, Washington, D. C."

The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 21 and 27 years of age, a graduate of a dental school legally authorized to confer the degree of D. D. S., and shall be of good moral character and habits.

Acting Dental Surgeons are employed under a three years' contract, at the rate of $150.00 per month. They are entitled to traveling allowances in obeying their first orders, in changing stations, and in returning to their homes at termination of service. They also have a privilege of purchasing certain supplies at the Army commissary. After three years' service, if found qualified, they are promoted to the grade of dental surgeon with the rank of first lieutenant, and receive thereafter the pay and allowances appertaining to that rank.

In order to perfect all necessary arrangements for the examination, applications must be in the possession of the Surgeon General at least two weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There will be 12 vacancies to be filled.

OBITUARY

The Committee on the necrology of one of our members reports as follows:

Whereas it has pleased our God and manager of all things to remove Eugene A. Johnson by death, the commonwealth has lost a worthy citizen of the highest type and our profession an eminent and highly respected member who, throughout his career, was ever among the foremost in working for the advancement of his fellow men.

Dr. Johnson was an earnest worker for higher ideals in dentistry. He was an earnest and forceful teacher and was highly appreciated by his confreres in the faculty of the University of Tennessee College of Dentistry, with whom he had been associated for several years.

In all professional and society work, his counsel and ability to perform were greatly appreciated. By his death the Memphis Dental Society feels that it has sustained an irreparable loss.

Therefore, we do *resolve* to give expression to our sorrow and feeling of loss caused by the sudden culmination of this Brother's noble career. We also wish a copy of the above sent to the bereaved family and to the Journals for publication.

J. D. Towner,
D. M. Cattell.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

Important Announcement

The Interstate Association of Anesthetists, comprising the states of Ohio, Michigan, Kentucky, Indiana, Illinois, Tennessee and West Virginia, at their meeting on May 4th, adopted the American Journal of Surgery as their official organ. On May 17th the New York Association of Anesthetists took the same action. These associations, with the American Association of Anesthetists, Scottish Association of Anesthetists and Providence Association of Anesthetists, who have previously adopted the American Journal of Surgery, makes this publication the official organ of all the representative bodies in the world, devoted to this most important branch of the surgical and dental art.

Subscription, $1.00 per year. May be ordered through The Dental Summary.

The New Illinois Drug Law

States are rapidly falling into line in the matter of drug restriction. The new Illinois law imposes a penalty from $50 to $200 for the second and subsequent violations of the pharmacy law, and prohibits the sale by other than registered pharmacists, licensed physicians, dentists or veterinarians, of any poisons or poisonous substances, opium, coca leaves or any compound, salt, derivative or preparation thereof, and imposes a penalty of $50 to $100 on any person making false representation to procure registration; prohibits the sale of opium, coca leaves, or any compound or derivative by any person except under prescriptions of licensed physicians, dentists or veterinarians. Notes certain exceptions to the application of the act and makes it unlawful for any licensed physician or dentist to prescribe for any habitual drug user any of the drugs hereinbefore mentioned except as medicine, and not for the purpose of evading any of the provisions of this Act, but in all cases shall report to the Board of Pharmacy in writing the name of every person being so treated and the date such treatment began.

Art an Aid to Dentistry

The Forsyth Dental Infirmary for Children, at Fenway, Boston, is about the first hospital to be beautified by decorators and sculptors. A competition was held for the design of the building and another for the decorations of the children's waiting room. Mr. A. H. Hepburn designed the decorations which represent the four legends of Rip Van Winkle, the Dorchester Grant, the Pied Piper of Hamlin and the story of Jason's quest for the Golden Fleece. The Delft pottery in Holland made tiles for these designs which are set into the walls of the hospital. In other parts of the building there are other interesting tile decorations. Miss Edith Browne has twelve tiles of Paul Revere's ride, made by the Paul Revere Pottery Company. Miss Browne has also about one hundred designs of animal, bird and fish tile pictures. There are also "Alice in Wonderland," some Boston historic subjects and copies of old Aztec tiles. These pictures are usually set three or four feet from the floor where they may be easily seen by the children. At the children's entrance are to be found scenes from "Uncle Remus," showing Br'er Rabbit and Br'er Fox in the center, and characters from "Alice in Wonderland" in a fairy ring with Alice asleep on the grass and the Cheshire cat in the branch of a tree. All this helps to forget a toothache.

Illinois Dental Law Amended

The Illinois legislature has just passed a bill that amends act relating to practice of dentistry by requiring that applicant for license, other than college graduates, shall have been engaged in practice for five consecutive years immediately preceding. Examinations shall be made in writing in theoretic subjects, and examination papers shall be preserved for two years.

Provides that applicants shall show satisfactory evidence of required preliminary education, and that a committee of examiners shall hold examinations at stated periods. Further provides for annual report and compensation of the board and for investigation of complaints. Regulates admission to practice in this state of a lawfully licensed dentist from another state.

Vain Hope

She—"What shall we get the baby for Christmas?"

He—"I wish we could get him the rest of his teeth."

WHAT IS DOING IN THE SOCIETIES

Texas—State

Galveston, May 23.—The chief work of the convention was the adoption of a new code of by-laws to conform with the rules and regulations of the National Association and the submission of a new constitution patterned after the constitution of the national body. The constitution was read entire, but discussion of its provisions was deferred until next year, when it will come up for adoption. The revision of the by-laws embodies new rules adopted by the convention held a year ago in Fort Worth, as well as laws to provide for the more complete affiliation with the National Association. One of the by-laws adopted during the present convention was among the important recommendations made in the annual address of President C. M. McCauley, of Dallas. It provides for the appointment annually by the president of a fraternal delegate to the State Medical Association. The committee pledged the association its strenuous efforts toward obtaining a college of dentistry to be an adjunct of the University of Texas.

In the discussion of the report of the legislative committee and the vetoing of the general dental practice act passed at the regular session of the thirty-fourth legislature, the convention left no doubt of its disappointment at the executive disapproval encountered when the bill was presented to Gov. Ferguson.

The members of the health and vigilance committee will be selected by the association, one from each senatorial district in the state. It will work in connection with the committees on oral hygiene and legislation. It was Dr. McCauley's suggestion that the committee shall develop a program of public education and exert its influence in the direction of public hygiene. It will be one of the duties of the committee to espouse the placing of members of the dental profession on boards of health, both state and municipal. The president's recommendations were discussed section by section and with the reading of the new by-laws and proposed constitution took up the greater part of the afternoon.

The installation of the new officers of the association was one of the final acts of the afternoon and the gavel of the association was turned over to the new president, J. M. Murphy, of Temple, in time for him to preside at the adjournment. The other officers installed were J. O. Hall, promoted from second vice-president to first vice-president, and W. H. Scherer, made second vice-president, to fill the vacancy, and the installation of W. O. Talbot, of Fort Worth, for another term as secretary-treasurer.

Minnesota—State

Minneapolis, June 12.—Six hundred Minnesota dentists attended the meeting of the Minnesota State Dental Association at the University of Minnesota today. Oral prophylaxis, surgical methods, local anesthesia and X-ray were the subjects of discussion today. The principal speakers were C. N. Johnson, W. H. Logan and A. J. Moor, all of Chicago.

The following officers were elected: President, Fred Owen, St. Paul; vice-president, G. M. Damon, Minneapolis; secretary, Max Ernst, and treasurer, W. J. Abernathy, Rochester. The meeting concluded today.

Alumni of the college of dentistry of the University of Minnesota had their annual meeting this morning. G. M. Damon was elected president; secretary-treasurer, Hulda Berger, Minneapolis; representatives of the general alumni association, J. N. Pike and Benjamin Sandy, Minneapolis.

Nebraska—State

Omaha, May 20.—Following officers were elected at the closing session last night: O. H. Cressler, North Platte, president; H. J. Porter, of Cambridge, vice-president; H. E. King, of Omaha, secretary; A. D. Davis, of Oxford, treasurer. W. A. McHenry, of Nelson, the retiring president, had charge of the meeting.

Guy Baird, of Fremont, was strongly pressed to take the office of secretary, but at his own earnest plea of overwork was allowed to withdraw from the race. A vote of appreciation was extended to him for his services to the organization during past years.

Florida—State

St. Petersburg, June 11.—The annual convention of the Florida State Dental Society came to a successful close at beautiful Pass-a-Grille, with the selection of Orlando as the convention city next year, which was followed by the election of officers.

The new official roster is as follows: A. M. Jackson, Lakeland, president; Jesse L. Williams, Jacksonville, first vice-president; C. Carabelle, Tampa, second vice-president; D. D. Cruise, Fort Myers, recording secretary; M. C. Izlar, Ocala, corresponding secretary, and T. S. Robinson, Jacksonville, treasurer.

Defective teeth account, it is said, for the rejection of 30 per cent. of the candidates for the British army. Of those accepted, a large proportion must undergo dental treatment before being allowed to proceed to the front.

"The use of alkaline dentifrices for the prevention of caries is wrong, is physiologically incorrect, unscientific and empirical, and not only so, but is also actually conducive to the inception and progress of disease, by decreasing the circulation and alkalinity of the fluids of the mouth."

From "The Prevention of Dental Caries and Oral Sepsis," by Prof. H. P. Pickerill, M. D.

LISTERINE

Listerine is an efficient, non-poisonous, unirritating antiseptic solution, especially adapted to the requirements of dental practice.

To cleanse and deodorize before operating

To wash and purify the mouth after extracting

To treat, antiseptically, diseases of the oral cavity

To prescribe as a detergent, prophylactic mouth-wash

The slightly stimulating effect of the feeble boracic acid acidity of Listerine is of the highest importance in maintaining a healthy equilibrium of the fluids of the oral cavity.

Literature fully descriptive of Listerine, also a paper embodying data respecting Emetine, together with suggestions for the preparation of a mouth wash for the

Prophylaxis of Endamoebic Pyorrhea

may be had on request

Lambert Pharmacal Company

2101 Locust St., St. Louis, Mo.

Louisiana—State

New Orleans, June 5.—The largest and most useful convention of the State Dental Association was held at Grunewald Hotel during the past three days. All of the papers will be printed later in The Dental Summary, official magazine of the society.

Kentucky—Southwestern

Paducah, Ky., May 27.—At a meeting of the Southwestern Kentucky Dental Association in Paducah, the annual election of officers resulted as follows: President, E. H. Gardner, of Bardwell; vice-president, O. B. Powell, of Paducah; treasurer, W. E. Moss, of Hickman; secretary, Will V. Owen, of Paducah. The next meeting will be held in Paducah, August 2d.

Michigan—Upper Peninsula

At the annual convention of the Upper Peninsula Dental Association, at Menominee, May 22, F. C. Runge of Houghton was elected president; E. G. Robbins, of Ishpeming, vice-president; S. G. Main, of Ishpeming, secretary and treasurer.

Ishpeming was chosen for the next annual convention of the society.

The banquet held at the Hotel Menominee in honor of the visitors was a delightful affair. Covers were laid for eighty-eight.

Michigan—Grand Rapids

Grand Rapids, June 8.—Officers were elected as follows at the annual meeting of the E. S. Holmes Dental Club, in the Morton House, last night. President, Irving D. Carpenter; vice-president, C. Luverne Watt; secretary, D. J. Dunwell; treasurer, W. A. Dorland.

The special committee on dental examination in the Straight street school reported that of the 271 children examined, average age 10½ years, only 18 had teeth at all nearly perfect and over 169 had never had a dental examination.

Dr. B. H. Masselink spoke of the necessity for oral hygiene.

The Spring Crop of Dentists

The following lists of dental graduates from the colleges named have been reported to The Dental Summary:

Indiana Dental—70.
Virginia Medical—20.
Atlanta Dental—53.
Barnes Dental, St. Louis—15.
North Pacific Dental—72.
Texas Dental—12.
Kansas City Dental—49.

Both Legs Off—Happy as a Clam

A striking personality and a living example of pluck and optimism is Dr. H. L. Henry, of Ashland, Neb., who attended his twentieth convention at Omaha last month. Both of Doctor Henry's legs are off close to the hips and he walks by means of his hands. An accident in a grist mill when he was 14 years old was responsible for crippling him.

But is he disheartened? Not by a jug full. His face is round and fat and beaming, and his eyes dance with happiness.

"You seem to be just about as well off as a man who has legs," said the interviewer.

"Better, a whole lot better," said this man who laughs at fate. "You see I don't have to buy shoes and I'm never bothered with corns."

Doctor Henry has been a member of the dental society for twenty years. He does his work seated on a high stool and with instruments that are operated by electricity.

"Hello, Doctor Henry," cried a fellow dentist, shaking hands, and then added in a whisper, "Say, what was the name of that corn remedy that you recommended to me?" A hearty laugh on both sides.

"We have lots of fun and plenty of puns," said Doctor Henry. "People often try to give me alms, especially when I go off on my annual hunting trip to the northwest. I'm dressed in my hunting clothes and naturally I look as though I might need a few pennies. It's great sport.

"It's a standing joke in Ashland to send any sort of crippled beggars to me. If they just have an arm off or even have their arm in a sling the boys will point them to my place and they come in. Then when they see me earning a living without a leg to stand on they make some sort of excuse and disappear as quickly as they can."

Seven hundred thousand New York City school children were given toothbrushes and trained in their proper use during the last week in May, which has been set apart and dubbed "Dental Hygiene Week."

The enrollment of students at the North Pacific Dental College, at Portland, Ore., numbers 346 this year, placing it fifth in rank among dental schools. Students are in attendance from 29 states, 7 Canadian provinces and 9 foreign countries.

The toothbrush, pillar and palladium of our civilization, is now being condemned by many writers, including Dr. Bernard Feldman, of New Jersey, as insanitary and even filthy and more of a disseminator of germs and disease than any other known agency. Instead of the brush the Japanese custom of the use of the clean fore finger and silk floss or strips is recommended.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV AUGUST, 1915 No. 8

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The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

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L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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Foreign, U. P. U. Countries, $1.75. **Advertising Rates on Request**

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REGULAR CONTRIBUTIONS

THE RELATION OF MOUTH INFECTION TO SYSTEMIC DISEASE*

BY DR. MARTIN H. FISCHER

(EICHBERG PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF CINCINNATI)

INTRODUCTION

I AM SURE that the medical profession has never pressed home the importance of good teeth and their preservation half so effectively as has the dental profession. In fact, it has pressed home this lesson to the public at large so well that it is now almost impossible to get a patient who will submit to an extraction, or a dentist who will do it. I am not here tonight to urge a return to pristine methods. The only question I am going to discuss with you is whether we have allowed the pendulum to swing too far. We do not want to go back to the age when we lost our teeth easily. On the other hand, from the very fact that we do not now do so a very serious new problem has come up. Is the mere preservation of the teeth to remain the first consideration, or does not this in many instances become a menace to our general health? To the discussion of this more modern question the dentists have also contributed much. They have told us times without number how close is the relation between unclean mouths, between diseased conditions about the teeth and systemic disease, but because their proofs have rested so largely upon clinical evidence alone not everyone has been convinced. In clinical observation so much depends upon the judgment of the observer and there is always so much of slippery ground that the conservatism which makes most of us skeptics is in good part justified.

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*Stenographic report of an address to the Cincinnati Dental Society, Jan. 29, 1915.

It marks a great step forward that a number of scientific researches which the last decade has brought us have served to prove unequivocally what many dentists long suspected and what some medical men have taught; namely, that there is a most important relationship between certain diseased conditions about the mouth and systemic disease. Now why is this question, as a general problem in medicine, so important? The answer is, I think, found in the following:

Within the years that all of us have been working in medicine we have seen two great changes come over the world. First, we have seen the average length of life per individual gradually increase; second, if we look at the lists, we see that the causes of death have increased in some of the columns and decreased in others. There is, for example, an agreeable falling off in the deaths due to typhoid, to cholera, to smallpox; an increase, on the other hand, in the number of heart and kidney deaths, of those due to arteriosclerosis, and to certain other things too frequently regarded as the necessary accompaniments of "old age." We shall return to this problem later, but even now I should like to emphasize that old age is, in my opinion, not so much the cause of many of these pathological changes as these are the cause of old age. There is a physiological death, but I question very much, judging simply from the people and patients that I have seen, whether a physiological death ever occurs much below ninety or a hundred years. The question therefore comes up, if we no longer die of the old causes and we do not—then what is it that does carry us away in our forties and fifties and sixties? Barring gross accidents and such things as cancer of the true nature of which we as yet know nothing—we now die very largely of the direct and indirect consequences of low-grade infections, the nature of which is only just becoming clear. And since these infections must have a beginning and must come from somewhere, and since a part of this somewhere is in the mouth as we shall see, we have every reason to feel a keen interest in our evening's discussion.

The truth of all this will come home to you more clearly as we proceed. We do not die of acute scarlet fever, of acute typhoid, of acute pneumonia, as much as we used to, but most of us do not yet die physiologically. In our city, for example, there used to be several hundred typhoid cases with many deaths every year; and now we can hardly find one to demonstrate to our medical students. Just think what that means. But very evidently those who have been spared typhoid are being saved up for death by another cause, and it is for us to ask what these newer causes are. The present-day point of view in medicine is on this account a totally different thing from what it was a score of years ago, for our medical problems, in their quantitative relationships, if in no other, are totally different from what they once were.

And yet as we go along we will observe that even these newer deaths are still attributable to much the same enemy that harassed us before, only it is less virile in that it does not strike us down so rapidly. The victims die, in other words, of subtler forms of infection, of subtler types of disease. Where do these subtler things come from? They are systemic infections very largely, as we shall find, but they spring from local causes, which, because they are at times very small, have been and still are largely overlooked.

HISTORICAL REMARKS

The so-called specialists in medicine have, of course, frequently called our attention to the close association between disease in their particular divisions of the body and disease elsewhere in the organism. Thus, the aurists have long emphasized the important relationship between infections of the ear and infections of the brain and its meninges. The rhinologists have emphasized the same thing in their region. The gynecologists in their turn have long known that infections spreading through the Fallopian tubes are a frequent cause of local or generalized peritonitis, while infections of the uterus are commonly the source of generalized infections. A great many women, for instance, who do not die of the acute childbed fever which was so common years ago, still die of this in a subtler form that is all too frequently overlooked. Infections starting in the torn surface of the uterus spread into the circulation and from here with the circulating blood through the whole body. It is just this type of low grade infection that we are going to discuss tonight.

The genito-urinary specialists have called attention to the important relation existing between the organs with which they deal and systemic disease. I remember when the gonococcus was first recognized as capable of giving rise not only to a local infection but to a systemic one as well. From the local focus the gonococcus may spread into the general circulation and thus give rise to endocarditis, if the organism locates in the heart valves, or to so-called gonorrheal rheumatism if it locates in the joints.

The dentists have also taught us many lessons in this regard. For a good many years they have emphasized the important connection between trouble in the mouth and systemic disease. William Hunter, in England, preached this lesson and none ever did it better than M. H. Fletcher of our own city. Fletcher was the first to convince me that a diagnosis of trifacial neuralgia never meant anything. Of course, some medical men had suspected this in some cases, but most held then, and some still hold, to a neuralgia *sui generis*. Well, neuralgia means pain in the nerve and is just as complete a diagnosis as headache and toothache. The time has come when we are justified in raising our eyebrows and praying for the patient whenever a doctor diagnoses a case as neuralgia and stops content. The neuralgia, in other words, is a symptom expressive of a pathological change in the involved nerve such as an intoxication or a true neuritis, and many a one as it involves the nerves of the face is but the expression of an intoxication or an infection traveling up the fifth nerve from a tooth.

Of thirteen cases of trifacial neuralgia which Fletcher studied he relieved twelve by proper treatment of infections about the teeth. I always like to compare this record with that of some of my surgical friends who have handled the same distressing condition in other ways. A popular method with them is to pull the fifth nerve out by the roots. In other words, the telephone bothers them, so they rip out the line. They have other ways also of handling the situation. Instead of recognizing the true origin of the trouble and locating it, as is commonly the case in the teeth, the surgeons kill the nerve or paralyze it with alcohol.

INFECTIONS OF THE BLOOD STREAM AND SYSTEMIC DISEASE

The researches of the last fifteen years have slowly forced home to us the enormous number of times that in various diseases we get infections of the blood stream, in other words, states in which showers of microorganisms invade the circulating fluids of the body. We used to think that everybody thus attacked, in other words, every victim of a bacteremia was doomed to die. When I was a medical student—blood cultures were just becoming common then—a positive finding was practically synonymous with a fatal prognosis. We have gotten over that notion, and as our methods for discovering these bacteria in the circulating blood have improved, we have gradually found a whole list of infections in which there is at some time in the period of the disease an invasion of the blood stream.

One of the first in which such invasion was recognized was typhoid fever. Originally the typhoid bacilli were cultivated from the feces. They were next isolated from the Peyer's patches, and at this time it was quite generally held that typhoid fever was essentially a disease of these patches from which soluble toxic products spread into the circulation to produce systemic effects. But then the typhoid organisms were isolated from the urine, from the rose spots and from the saliva, and finally from the blood itself. When the blood itself was found invaded it no longer appeared strange that the typhoid organism might be isolated from any of the organs and many of the secretions from the body. Thus, our conception of typhoid fever changed completely from that in which it was considered a local disease of the Peyer's patches with systemic toxic effects to one in which it was regarded as a systemic invasion with typhoid bacilli from which various local evidences of disease might arise. Localizing in the lymphoid tissues of the body it gives rise to the swollen and ulcerated Peyer's patches and to the enlarged spleen; localizing in the skin we obtain what are called rose spots; passing through the kidney we may obtain evidences of a nephritis.

Shortly after these discoveries were made, similar facts were found true of the pneumococcus. We used to think that lobar pneumonia was essentially a disease of the lung and as starting here. But as these patients were examined more carefully it was found that the organisms responsible for the lobar pneumonia not infrequently circulated in the blood. With improved methods of examination it was soon found that practically every lobar pneumonia case at some time in the course of the disease had the pneumococcus circulating in the blood. We have, in consequence, largely given up the old inspirational theory of lobar pneumonia and now regard it more as a disease which is in essence an invasion of the blood stream with marked local manifestations in the lung.

The same thing was proved true in splendid fashion for plague by our fellow citizen, William B. Wherry[1]. We used to distinguish sharply between the pneumonic type of plague which we held to be due to inspiration of the plague bacillus and the bubonic form which we held consequent upon the introduction of the organism somewhere into the lymphatic streams of the body. Wherry was able to isolate plague strains which when injected into the general circulation of animals, would localize, in one group of cases, in the lungs, and give the animals a pneumonic plague, while in another they would localize in the lymphatic tissues and give rise to a bubonic form. In other words, blood infection is really common to both, the peculiar manifestations of the disease depending upon the type of organism, this in its turn determining which clinical expression of the disease shall spring from the general blood infection common to both.

Tonight's subject deals with this same problem of blood infection and tissue localization, though the organisms which we shall discuss will be of a more ordinary variety. For the most part our remarks refer to the streptococcus, though several if not many another type of organism will shortly be found to belong in this same group from the point of view of anatomical and physiological effects produced by them.

What, in the first place, is the fundamental character of the infectious organisms which invade the blood stream to give rise to the various disturbances to be discussed tonight? Generally speaking, they are characterized by a rather low grade of virulence.

Applied to the specific example of the streptococcus group of organisms, this means the following: The streptococcus that we learned to know as students typified the most virulent of the various infections that harass mankind. We used to describe the symptoms following infection therewith as of sudden onset and characterized by high fever, great prostration, high leucocytosis, and very frequently, early death. At least a part of the old hospital gangrene of the Civil War was of this streptococcic type which would go through a hospital and clean out every ward in it. There is a great difference between this old picture and that of the streptococcus as we know it today. We now know streptococcus infections which show no fever, no leucocytosis and only a moderate invalidism. It must, however, be clearly remembered that if we look sharply enough we will even in these aberrant cases frequently find many things to help toward a correct diagnosis. Between these two extremes there are, of course, all grades of transition. The patients with these low-grade infections are, of course, commonly of the ambulatory type. They may have days of acute illness, of "biliousness;" they may be filled with aches and pains; they drag along for weeks, months and years, never very ill, but never well either. They are often anemic, frequently adjudged neurasthenic, many times hypochondriacal. In this way they may live out what looks like their allotted number of days, though not infrequently the more spectacular manifestations of a gastric hemorrhage, of gall bladder disease, of appendicitis, of an acute kidney attack, or an endocarditis may close the scene.

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[1] William B. Wherry: Personal communication, 1906.

What has happened to the streptococcus we used to know that permits it to play these new and varied roles, for, as we shall see, it is still this organism that is chiefly responsible for the clinical pictures we have drawn? The organism because of changes in its environment has changed many of its old-time qualities. Instead of the one streptococcus we used to know we now recognize a whole family of them which vary in their properties from being practically avirulent to those of the classical type with high virulence that we have already discussed.

MODIFICATION OF MICRO-ORGANISMS THROUGH ENVIRONMENT

This whole question of the modification of the properties of micro-organisms through environment has also received detailed study only in the last years. It is a little appreciated fact that our colleague, William B. Wherry, is again responsible for what are the most fundamental contributions in this field. Some ten years ago he showed that the cholera-red reaction which is typical of the spirillum of this disease depends upon the kind of medium upon which the organism is grown[1]. If the organism cannot produce a nitrite out of the medium in which it lives this so-called cholera-red reaction does not develop. Here we have the development of a certain substance giving rise to a typical bacterial reaction dependent absolutely upon the nature of the culture medium in which the organism is made to live.

As is familiar to you, there occasionally appear in tubercle bacilli what are called spores. They are not true spores, but they are called such because they look like them. Their development also depends upon the type of medium in which the organisms are grown. Wherry[2] has been able to produce the "spore" bearing type of tubercle bacilli and the ordinary familiar form at will by simply varying the composition of the culture medium. But still more interesting, he has also been able to vary that property upon which depends under ordinary circumstances the very recognition of the tuberculosis group, namely, their so-called acid fastness. The tubercle bacillus stains, as you know, with certain dyes, and after being thus stained, is not decolorized by acids. The power of resisting this decolorization, in other words, the acid-fastness, can be varied at will, depending upon the kind of medium in which the tubercle bacilli are grown[3].

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[1] William B. Wherry: Jour. Infectious Dis. 2, 436, (1905).

But most interesting, perhaps, is the fact that he has been able to control what biologically amounts to a change of one type of organism into a totally different class. By alterations in the surrounding medium he has been able to cause certain amebæ which you know as gelatinous masses crawling over a slide, to change into free swimming, flagellated organisms and back again—a most remarkable piece of work. These accomplishments of Wherry[4] mark the most tremendous variations in a biological sense that have ever been accomplished by external means in any group of organisms.

Let us turn now to the studies of E. C. Rosenow, of Chicago, who by special methods of isolation and growth has been able to produce marked variations in the members of the streptococcus family. While these studies are less striking in a general biological sense, they are most significant in their practical bearings upon the every-day problems of health and disease. Some years ago we recognized as fixed forms the old streptococcus pyogenes, the streptococcus longus and the streptococcus brevis all varieties of pus formers; then we had listed also the streptococcus erysipelatis, a short chained affair occurring in erysipelas cases; to these was added the streptococcus rheumaticus of Poynton and Paine, isolated by them from acutely affected rheumatic joints and a little different in morphology and behavior from the other types. To this already long list then came another streptococcus which, because it forms green patches on media containing blood, is known as the streptococcus viridans. As it is commonly obtained from the vegetations in endocarditis it has also become known under the separate heading of streptococcus endocarditis.

One of the very important contributions of Rosenow[1] to this whole subject has been his demonstration of the fact that these various streptococci, including the so-called pneumococcus, are related and that it is possible to change the typical representative of one of these classes over into a totally different one at will. In other words, a streptococcus known by one name in one place can by proper cultural methods be changed over into another totally different type. The important thing to be kept in mind in this connection is that such changes in culture ground occur not alone in the cloistered atmosphere of our laboratories, but daily in nature. In other words, an organism like a streptococcus living an avirulent existence in some neglected point of our anatomy, may any day become the progenitor of a highly virulent family with mutilating and death-dealing properties if the surroundings of the organism be slightly changed.

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[1] E. C. Rosenow: Jour. Infect. Dis., 7, 410, (1910); ibid, 14, 1, (1914).

[2] William B. Wherry: Centralbl. f. Bakt. Parasitenk. u. Infektionskr,. 70, 115, (1913).

[3] William B. Wherry: Jour. Infectious Dis., 13, 114, (1913).

[4] William B. Wherry: Arch. f. Protistenkunde, 30, 77, (1913).

Let it be emphasized that these changes in environment are occurring constantly in our bodies and often in very small areas. To give a concrete illustration and one that fits our interests tonight, the mere pulling of a tooth with the trauma incident thereto may so change the environment that what was a perfectly innocuous type of infection becomes a virulent one which may kill a patient. And why? Simply because the trauma may so injure the tissues that where once there was plenty of oxygen there is now little or none, in consequence of which an organism which previously grew in a saprophytic sort of way is now entirely changed, to the disaster of its host.

FUNDAMENTAL SYSTEMIC PATHOLOGY

But not only has Rosenow demonstrated how from one type of streptococcus others may spring, but he has also shown how their pathological effects are in essence all produced in the same fashion. Nearly all these systemic effects, by whatever name we are going to call them later, are due to the fact that the organisms involved get into the general blood stream and while floating in this, get caught somewhere in the smallest capillaries supplying different portions of our bodies. And, depending upon the particular "affinities" of the organism and the location of the capillaries in which they are caught, these infections give rise to a whole series of different clinical manifestations to which very different clinical names have been and are attached. In other words, following their entrance into the blood stream from any focus whatsoever, these micro-organisms ultimately give rise to the phenomena of infectious embolism. Only, depending upon the organ struck (in its turn but the expression of accident and the particular type of organism involved), we get totally different clinical manifestations. Unless we as doctors see the whole patient and understand what has and is happening we can do little to help him even though we send for half a dozen specialists to reach each of the organs that may be involved. We do not need the specialists half as much as one man who will find for us the open door through which the infections have entered or are entering and from which pathogenic organisms are being sown broadcast into different organs.

After an infection has broken over into the blood stream where, first of all, may the organisms localize and by what clinical name is the localization likely to be designated?

The infection may localize in the heart valves. We used to be taught that to produce a valvular endocarditis, bacteria floating in the general blood stream reached the valves, stuck to them and then produced the set of inflammatory changes which we call endocarditis and which clinically give rise to the signs and symptoms that some call valvular heart disease. Rosenow[1] has shown that this notion is absolutely wrong. Bacteria floating in the general blood stream have never been observed to hurt the heart valves at all. As you know, the heart valves themselves have practically no blood vessels in them. These run in the body of the heart muscle; and at the places where the valves are located, the capillaries simply loop and dip into the fixed base of the valve. The main leaf of the heart valve is entirely free of blood vessels. It is the bacteria floating and getting into these capillaries at the base of the valves that give rise to the original lesion in valvular endocarditis. In this locality the oxygen is not very plentiful and they begin to develop virulent characteristics which originally they may not have had at all. Thus, our endocarditis begins at the base of the valve and gradually spreads out over it, finally, perhaps, to involve it all and maybe destroy it.

But just as these micro-organisms may localize in the tiny end-arteries of the valves, they may also come to rest in the muscles.[1] The usual spot chosen is where muscle joins tendon, for it is here that the circulation is least perfect. Since this is synonymous with the least adequate supply of oxygen it is not surprising that here the micro-organisms do their greatest mischief. What we have described is the mechanism by which muscular rheumatism is produced and explains why rheumatic pains and the tenderest points in this disease are located, not in the bellies of the skeletal muscles, but at the junction points between muscle and tendons.

The same changes that appear in skeletal muscle may appear in heart muscle. Through such embolic infections we are able to understand the origin of many types of myocardial degeneration.

As you know, the linings of joints are also supplied with end-arteries. They penetrate the synovial membranes and make a loop in them. Bacteria may localize in these loops and, followed by the ordinary inflammatory and proliferative changes characteristic of such infection, give rise to small destructive lesions. Briefly put, these are small infarcts. Usually they are anemic, but if bleeding occurs the infarcts become hemorrhagic in type. In either case a destruction of the involved area is common. When these things happen we have before us the fundamental pathology of a so-called joint rheumatism. If the process occurs like a bolt from the blue we call it acute articular rheumatism. If it is very slow in its progress and involves not only the tissues of the joint itself but also those about it, and we have in consequence in close proximity evidences of an atrophic and a hypertrophic type of inflammatory change, we call it arthritis deformans. Let me add that, in my opinion, many such cases are also called gout.

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[1] E. C. Rosenow: Jour. Infect. Dis., 7, 410, (1910).
[1] E. C. Rosenow: Jour. Am. Med. Assoc., 60. 1223, (1913).

These infectious embolic processes may occur also in the blood vessels of the skin. This marks the origin of many different types of skin eruption. One type that Rosenow has been able to reproduce in animals by injecting certain streptococcus strains is the so-called erythema nodosum. What tyrants words are! How often have not patients come to us, told us they have red and swollen patches somewhere about their persons, and we have sent them away satisfied after translating what they told us into Greek and Latin!

But not only may the streptococcus group circulating in the blood localize in the heart, in the muscles, the joints or the skin, but it may do this in the small arteries of the kidney (E. R. Lecount and Leila Jackson[1]). When such occurs it marks the origin of certain types of nephritis. These are frequently diagnosed Bright's disease. The name Bright's disease ought really to be used only in connection with the kidney changes observed in arteriosclerosis. Bright never described half the things now called by his name. He recognized the clinical entity of vascular disease with kidney involvement, but since his great communication on the subject, everything that yields a little albumin and some casts in the urine is popularly called by his name. If you yourselves hold this opinion, then a streptococcus infection of the blood stream constitutes one of the possible ways of getting Bright's disease. The infectious emboli commonly locate in the glomeruli, but they may also come to rest in the capillary beds about the convoluted and straight tubules. In consequence of the tiny infarcts thus produced spot after spot in the kidney is eaten away. As the spots die, albumin and casts appear in the urine. The amount of such spotty involvement may, of course, be very general and occur very acutely; or it may be very local and slow-going but nevertheless progressive in type. Depending upon which prevails, we have either an acute or a more lasting, chronic type of nephritis.

As already indicated, it is usually after a primary involvement of the blood streams with micro-organisms that the lungs may become the seat of a localized infection, not only in the striking way known as lobar pneumonia, but also in that patchy form known as lobular pneumonia. Not only may these pulmonary infections be decidedly acute in type as is so commonly the case, but chronic.

To this long list of clinical entities, underlying which we now recognize embolic infections of various kinds (particularly with the streptococcus), we must now add some types of thyroid disease. A great many of these are really infections of the thyroid glands secondary to a blood infection originating in some neglected focus elsewhere in the body, as in the teeth. The first time this was told me I confess that my confidence in the world's sanity shook a little. Had not everybody taught us that hyperthyroidism was "metabolic," "idiopathic," "physiologic," and all that sort of thing?—fine words to stupefy us and keep us stupid.

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[1] E. R. Lecount and Leila Jackson: Jour. Infect. Dis., 15, 389, (1914).

The gospel of infection was preached to me by Rollin T. Woodyatt[1], who called my attention to the practically constant association of "goiter" in patients with mouth infections. In one morning he showed me five patients with typical signs of hyperthyroidism (tremor, cardiac attacks, eye signs, etc.), in everyone of whom there was well marked infection about the teeth. With my lesson learned it was no trick in the next two days to find three goiter cases among some patients of my own and to observe that all had dirty mouths. To these clinical observations of Woodyatt, Rosenow[2] has since been able to add experimental ones which prove absolutely the infectious nature of at least many of the hyperthyroidism cases. He has isolated streptococci from human thyroid cases, which, when injected into dogs, are followed by the development in them of all the signs of hyperthyroidism.

Whenever new light is found it is of interest to look back and see who in the army of the past saw best with the candles that were once supreme. The French clinicians frequently emphasized and commented upon the many similarities between the general signs and symptoms of hyperthyroidism and those of acute rheumatism. Thus, in the acute rheumatisms, there is a tendency to sweat, a loss of flesh, a tremor and a hyperirritability of the central nervous system. As you see, these are also all signs of hyperthyroidism.

Last summer while going through the library in an idle moment I took down Graves' monograph on the disease which bears his name. It is an interesting fact that the clinical details of his first case show this to have been one of hyperthyroidism in a woman convalescent from acute rheumatism. But acute rheumatism, as you know, is now but the clinical name for a streptococcus infection of a certain type.

Now, not only has it been possible in the instances thus far cited to work out clinically the connection between recognized bedside pictures and certain infections, to isolate the organisms concerned and with them to reproduce in animals the clinical pictures from which the organisms were originally taken, but it has also been possible to do this in the case of gastric and duodenal ulcer, cholecystitis with stone, and appendicitis. In other words, gastric and duodenal ulcer is the product of an infectious embolism involving a larger or smaller patch of the mucous membrane in stomach or duodenum. The same is true of cholecystitis. Rosenow[1] has isolated from the walls of infected gall bladders and from gall stones strains of streptococci which, when injected into the circulation produce a typical cholecystitis, in the course of which tiny gall stones may be seen to begin their development upon the surface of the inflamed mucous membrane lining the gall bladder. It is a fact of great interest, in keeping with the general idea of the embolic nature of these infections, that such cholecystitis cannot be produced by injecting the streptococci into the portal circulation, but only by injecting them into the systemic. Similar statements may be made regarding appendicitis. Organisms isolated from the walls of infected appendices will on injection into the general blood stream reproduce the disease. It is certainly a remarkable and interesting fact that we get appendicitis, according to the best evidence now available, not through an infection which travels from the bowel, for example, into the lumen of the appendix, but from micro-organisms circulating in the arterial blood which have gotten into this from some distant focus of infection.

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[1] Rollin T. Woodyatt: Personal Communication, (1914); see also, Frank Billings: Jour. Am. Med. Assoc., 63, 899, (1914).

[2] E. C. Rosenow: Personal Communication, (1914).

[1] E. C. Rosenow: Jour. Infections Dis. (1915).

Once we get these things clearly in mind it becomes evident how entirely inadequate is the mere diagnosis of stomach ulcer, of gall bladder disease, of gall stones, of appendicitis even. True, these are local manifestations and such as fill with their acuity and immediate dangers our entire consciousness, yet if we remember their infectious origin and that this infection got in somewhere, how important becomes the problem of discovering where this somewhere is.

To these observations needs now to be added one by Wherry[1] which is destined to play an enormous role in our future concepts of disease. Wherry has shown that many patients suffering from local infections, as about the teeth, get and have periodic sowings of bacteria into their blood streams apparently without developing therefrom any localizing symptoms whatsoever. It will be interesting to discover how many of the down-and-outers and bums that frequent our city institutions are really the victims of such infection and how many are constitutionally worthless. Our hearts should not bleed too easily for the really unfit, but I confess to being moved by Petri plates showing scores of colonies of the streptococcus family cultured from the general blood stream of patients who, on careful clinical examination, show nothing but bad teeth and sore gums. Let me emphasize that many of the patients studied by Wherry were not bedridden and were in the hospital for minor ailments. Many would be regarded as mere loafers; most were "unfit" from the standpoint of industry. As a matter of fact, they were ill. This type of infection is unquestionably common beyond anything we think at the present minute. It is responsible, I think, for much that is called "autointoxication," "migraine," "dumb gout;" and the real cause of many an anemia. Whence come the pasty-faced individuals that fill our cities? Many if not all are the victims of low-grade systemic infections of a very chronic type.

The world is full of these people who are not overly well. If they are over forty a great part of their infirmities are commonly laid to the menopause or to an oncoming or established "old age," things which, of course, express nothing more clearly than our ignorance. To assign things to old age explains nothing; we need then to explain old age. And here much light is going to come to us soon. Conservatively, I think half the things we today attribute to old age are really the things that make us old. As has so frequently happened in medicine, we have gotten cause and effect hindside to. Is not arteriosclerosis, for example—or, as I prefer to call it, vascular disease—caused by old age? Were it, then why will so many of the really aged persist in carrying soft and unscarred arteries into the grave; and why, on the other hand, will some men in their twenties, some in their thirties, and great crowds in their forties, begin to show the evidences of disintegrating circulatory systems? Is it not more probable that the bad system of pipes determines the premature old age, and not the other way about? If this seems reasonable, then whence come the vascular changes? Whenever we are ignorant of the etiology of disease, particularly chronic disease, we lay it at the door of man's vices. And this has happened for arteriosclerosis as for other obscure things in medicine. The only trouble is that on looking about one observes the most virtuous dying of this thing. The worst arteriosclerotic I ever saw was a middle-aged, well-to-do, industrious farmer who worked moderately every day in the California sunshine, who used no coffee, tobacco or spirits, and whose personal life was so exemplary that the people of his valley called him "Ernest the Good." In other words, there are people who never drink anything, who never smoke or chew, who never use coffee but drink its horrible substitutes, who do not overwork or overworry, who avoid all foods that are worth eating, and yet all this gets them no reward in the way of freedom from vascular disease. Please understand me correctly in this matter. I am not maintaining that excesses in some of these directions may not be bad for the individual who *has* vascular disease. I only want to emphasize that there is no evidence at hand to show they caused it.

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[1] William B. Wherry: Personal Communication, (1914).

The reason I say this so emphatically is because this old guard of alcohol, tobacco, coffee, lead poisoning, hard work, meat diets, etc., all represent general types of intoxication. In other words, they represent intoxication with a soluble poison circulating through an organ. But we do not know any such soluble poisons, which, when experimentally or otherwise introduced into an organ, will involve only parts thereof. When arsenic or lead or phosphorus circulates through a kidney, a liver, or the heart, it affects the whole quite uniformly. This holds true for the blood vessels, too. You cannot circulate a soluble poison through the kidney and not have the whole organ poisoned; and you cannot take a dilute solution of alcohol or similar material, have it circulate hour after hour through the blood vessels and only injure patches in them. Yet vascular disease (arteriosclerosis), no matter how advanced, is never seen to have involved all portions of the blood vessels. It begins and ends as a patchy disease, for even the most advanced types of the disease show healthy portions of blood vessel. The patches of vascular disease as seen in the larger blood vessels really begin in the areas about the vaso-vasorum. In other words, vascular disease begins in and is essentially a disease of the smallest blood vessels. When it attacks the large blood vessels, it really does so only indirectly by affecting the small blood vessels which supply the coats of the large with nutriment.[1]

We have known for many years that in an enormous proportion of the arteriosclerotics (in something like sixty per cent. of them, according to certain authors), an organism is responsible for these focal changes in the blood vessels, namely the treponema (spirochete) of syphilis. The essential changes are again those of infectious embolism involving the vaso-vasorum. In the remaining forty per cent. of cases (and probably mixed in as secondary invaders with many so-called syphilitic ones) we will unquestionably find other organisms constituting the emboli from which follow the pathological consequences that yield us ultimately the picture which pathologically we call vascular disease, and clinically arteriosclerosis, or what you will.[2] The infectious embolism is again followed by infarction, by partial attempts at regeneration, by more definite evidences of degeneration, the whole capped, maybe, by a deposition of calcium salts. And following these changes in the blood vessels, as they involve different organs, we get that whole troupe of "diseases" so likely to fill our later days. There may be hemorrhage into a vital organ like the brain or medulla; or a slower shutting off of the blood supply with mental deterioration, stupor, coma and death; or portions of the kidney may gradually die, giving us a chronic Bright's disease; or the changes may involve the heart and we die of a myocardial degeneration; and so on *ad infinitum*, just depending upon where in our bodies this blood vessel disease shows its hand most conspicuously.

I have given you now a very long list of "diseases," at the causes of which we could only guess a few years ago, but which today we know definitely to be due to infection. The matter is no longer one of opinion or hypothesis, but of proved fact. But to accept this, if it has not already done so, must change our whole viewpoint in practice. The bulk of medical practice is made up of the very diseases I have read to you. Very evidently the time is past when we may rest satisfied with the mere diagnosis and treatment of rheumatism, gastric ulcer, vascular disease. Exactly as in diphtheria, scarlet fever, erysipelas, we must not only meet the obvious problem but trace it to its source to the end that our patient may not again become the victim of a like attack, or a menace to those near him. In all these patients we must work backwards and discover the original point of entrance of the infection. What good does it do to treat an acute rheumatism if after we have nursed the patient through one attack he is left liable to a second, third and fourth? This game cannot be beaten forever. And what is true of rheumatism is true of endocarditis, of gastric ulcer, of appendicitis, of gall bladder infection and the rest of the category. As long as the patient continues to carry about in him his original source of infection, he can get his symptoms over and over again.

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[1] Martin H. Fischer: Oedema and Nephritis, page 499; second edition, New York, (1915).

[2] See in this connection the vascular changes noted by T. B. Hartzell and A. T. Henrici: Jour. Am. Med. Assoc., 64, 1055, (1915), after intravenous injection of streptococci isolated from alveolar abscesses.

POINTS OF ENTRANCE FOR SYSTEMIC INFECTION

This explains why it is so necessary to discover this original source or sources. And where, pray, are they most likely to be found? The tonsils are among the most conspicuous flophouses for these infectious organisms. They have, of course, long been the subject of much uplift work by the nose and throat surgeons. I confess to having myself laughed at the surgeons, but many times since have I asked for forgiveness. As a medical man the appeal to surgery has to me much of the cry of defeat about it, but the most radical tonsillectomist is a conservative compared with me now, for the tonsils are such prolific sources of systemic infection. I have insisted on the removal of many a tonsil which some of my throat colleagues said might stay. No tonsil from which pus may be squeezed is above suspicion, and let me add that I have squeezed pus from not a few tonsils in which some of my nose and throat colleagues said there was none. I am going to apply this lesson to the dentists in just a minute. Let me emphasize that in patients with the constitutional findings which we are discussing, especially when progressive in type, such foci of infection *must* be found. The negative reports of half a dozen specialists mean nothing in these matters. Only positive findings count. I have seen Rosenow find pus in tonsils where throat men swore there was none. He has now equipped himself with dental tools and laryngologists' instruments with which he gets pus out of teeth where dentists did not see any and out of sinuses and throats where laryngologists missed it. And the pus thus obtained is proven the source of the various constitutional signs of which the patients complain, because when injected into animals these develop the same pathological pictures as shown by the patients.

You see what this means. In the too intense contemplation of our particular fields of specialism we are likely to lose sight of the whole man; and then it takes a genius like Rosenow to put us on our feet again and to teach us that a plain doctor is after all more important to the patient than a whole group of specialists.

What has been said of the tonsils holds also for the nose; for the sinuses of the head; for the ears. In women we must consider the pelvis as a focus for infection, and in men, the genito-urinary tract.

This ends the list of the common places in which infections are harbored, until we reach your own specialty, that of the teeth.[1] When the tonsils are out (really out) as is commonly the case in young adults, when there is no infection in the ears or sinuses, when there is no genito-urinary infection, the pròblem usually comes right down to the dentist. Personally, I think that this matter of infection about the teeth, judged by its established and potential consequences, is today the biggest one problem in medicine.

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[1] The intestinal tract is undoubtedly a prolific source for occasional or periodic infections of the blood stream and so of the whole man. There is much strong clinical evidence for this and some bacteriological. I omit intentionally discussion of this intestinal question because it is not yet proved in the conclusive fashion in which are the other questions taken up tonight.

As I have emphasized previously, the gospel of the association between infections of the teeth and these systemic disturbances has been preached off and on for many years, and, let me add, by not a few dentists. What gives force to these later-day arguments is that proof has ceased to rest merely upon good clinical observation and medical judgment. We have now absolute laboratory backing for the truth of what these men have so long maintained. Organisms have been isolated from the systemic foci of infection—from joints, muscles, gall bladders, gastro-duodenal ulcers, appendices, etc.—and with these organisms the specific disturbances have been reproduced in animals. And more, the same organisms have been isolated from infected teeth (and other foci of infection) and with these the same constitutional disturbances exhibited by the patient, such as muscular and joint rheumatism, gastro-duodenal ulcers, gall bladder infections, etc., have been produced. The chain of evidence is, in other words, complete.

The clinical evidence for the correctness of these things is most striking. I am not going to weary you with a recitation of case histories, but the improvement in patients when the source of their troubles is discovered and removed is really most remarkable. Most illuminating illustrations of this kind have been detailed by Frank Billings.[1] The future will turn to Billings' work and see in its practical results a greater release for man from his sufferings than in any other work of the past decade.

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[1] Frank Billings: Arch. Int. Med., 4, 409, (1909); ibid, 9, 484, (1912); Jour. Am. Med. Assoc., 61, 819, (1913); Illinois Med. Jour., 25, 11, (1914); Jour. Am. Med. Assoc., 63, 899, (1914).

(*To be continued*)

Defective Teeth Make Bad Boys; Teach Them to Use a Toothbrush

It is not sparing the rod but sparing the tooth brush that spoils the child. The president of the New York juvenile association asserts that 91 per cent. of the delinquent boys that come to the association to be looked after have bad teeth from which they suffer, and that instead of worrying any about their morals the association worries about their teeth, with the result that after two years of competent dentistry and daily use of the toothbrush, 90 per cent. of the boys are turned out as reformed.

The New York institution has found that the bad boy is usually an anaemic boy, the anæmia being due to poor digestion through insufficient nourishment caused by bad teeth. When this is corrected the boy becomes normal, takes on a saner and healthier view of life and its duties and changes his whole moral attitude.

URIC ACID — A SUPPLEMENT TO LAST YEAR'S PAPER*

BY J. L. MEWBORN, D.D.S., MEMPHIS, TENN.

SOME OF YOU WILL REMEMBER that in closing the discussion of my "Uric Acid" paper last year, I announced that, for sufficient reasons, I was holding back a part of that paper, but hoped to develop it later. I am here today for that purpose.

You will also remember that paper was prepared for and read before the Memphis Dental Society in February, 1914, then read before the state Association in June, 1914; afterwards was published in the April, 1915, DENTAL SUMMARY. During this period the oral cavity was stigmatized as the "foci" of infection for nearly every disease to which the human body is subject.

In the discussion of Doctor Schuman's paper on this subject, all concurred in the opinion that tartar was the original cause of pyorrhea, that autogenous vaccine was the coming treatment and cure for all these ills. After the cause had been *entirely* removed, Doctor Schuman believed that a cure would probably result in all instances, but he had never yet seen a case where it had been *entirely* removed by local manipulation.

On the subject of vaccine treatment, Dr. C. P. Emerson, Dean of the School of Medicine, University of Indiana, in the May SUMMARY, says: "The argument that we are to look in the mouth for the source of infections of the rest of the body, is something not yet proven. As for me," he says, "I do not believe there is a smithereen of value in the vaccine treatment."

At this juncture another Richmond entered the field, and entamœba was discovered to be *it*, and emetin, like the Teuton's centimeter gun, leaped to the front as the annihilator of pyorrhea, as well as all former cures.

The vaccine treatment is no more. Alas! how soon the dead are forgotten. In the heyday of its (so-called) successses, I could not tolerate it; now, I have no condolence to offer.

This newest discovery, that entamœba buccalis is the specific cause of pyorrhea, and emetin is its specific cure, with indecent haste, and flamboyant style, is being heralded by the medical journals, by all the manufacturing chemists and numerous full-columned, unreliable preachments which, somehow, find easy access to the columns of the New York dailies.

This amoeba is a protozoön having a simple protoplasmic body, with nucleus and nucleolus, and effecting motion by finger-like pseudopodia, a process formed by a temporary extension and contraction of the protoplasm of a cell, or of a unicellular animal, serving for taking in food, for locomotion, etc.

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*Read before the Tennessee State Dental Society, 1915.

In the *Review* for December, 1914, is a paper by Dr. Angello Chiavarro, of Rome, Italy, read before the American Dental Society of Europe, July, 1914, the most exhaustive treatise on the amœba that has yet been produced. He closes the paper with the emphatic statement that the amoeba has *no pathogenic* action; on the contrary, as it feeds on bacteria, it is most probably an aid to the disinfection of the mouth.

Listen! if it is a fact that this amoeba has no pathogenic action on pyorrhea pockets filled with pathogenic bacteria on which it feeds its belly full, how can it at the same time make the mouth the "foci" of infection, *forsooth* to scatter the seeds of disease among the distant unprotected organs of the body? If it is a fact that the same constant motion and changes of shape of this amœba are exhibited by other single-celled organisms, as an ovum, or a formative cell of any of the higher order of animals, especially such movements as are exhibited, for example, by the white corpuscle of the blood of man, the resemblance of such objects to an amoeba being *striking*, and their morphological characters being nearly *identical*, are they also infectious and disease-producing organisms?

Listen! Dr. Grant Mitchell, the fire-eating writer from Pittsburgh, says that germs *thrive* upon necrotic tissues, and grow robust under the influence of mephitic exhalations, but they in *no way* contribute to the development or progress of disease. Thus have presumptive bacteriologists, with their hosts of blind followers and imitators, ascribed to germs their disease-producing power, and this in utter ignorance of nature's wonderful efforts to provide efficient scavenger service, at points inaccessible to larger, visible forms of rot-eating agents.

My friends, you forget that man is fearfully and wonderfully made. You forget that that great life-giving blood stream is better patrolled and fortified against the invasions of the microbe or the ferments than the Dardanelles against the passage of the war fleets of the Allies.

The white blood corpuscle, the leucocyte and the phagocyte in their war-like ferocity will penetrate any tissue of the body to reach the invading germ, and when the attack is made, front, flank and rear, the war is on to the knife, and the knife to the hilt.

It is said of recent experiments of the Doctors Dana and Berkley on the functions of the ductless glands, that a new aspect of medicine has been opened up which will occupy somewhat the same relative importance in the coming generations that the study of bacteria has occupied in the past. As yet, *no one* knows what may be the limit of the application of the glandular extracts in the treatment of disease, but from the results already obtained we have had a sure glimpse of a land of promise beside which the vast domain opened by Lister and Pasteur may sink into honorable insignificance.

It seems that the gland most directly concerned with the physical development of the child is the one known as the thymus, and is located in the chest, the mediastinum.

The gland, or group of glands, that controls the development of the functions that mark mature life is the thyroid, and is located in the throat. The gland that seems directly to control mental development is the pineal gland, located in the skull near the base of the brain; besides these are the spleen and suprarenal capsule.

To gain an inkling of the full measure of mystery involved in all this, it must be understood that the secretion put out by one or a number of these glands is not a food, but a stimulant which, in some utterly mysterious way, causes remote organs to functionate as they would not otherwise do. Heretofore the state of a child who was physically or mentally defective from insufficient action of this stimulant was most pitiable. Now it may be benefited or even cured by treatment with animal extracts from corresponding glands in the sheep, pig or ox.

Until recently it was supposed that the whole communication through which the actions of the body are co-ordinated is the nervous system, but now we know that the internal secretions serve as direct and tangible messengers that are not less important than the nerves.

From opsonin in the serum of the blood, the body develops specific ferments that combat every different type of protein.

From the peculiar manner in which the internal secretions thus act to influence distant organs, they have been given the name of hormones, from the Greek derivative meaning to arouse or excite.

Professor Starling first discovered that a secretion of the small intestine (called secretin) served as a signal to the pancreas to begin putting forth characteristic secretion to aid digestion.

The newest theory as to the function of the hormone is that secretin stimulates the tissues of bone-marrow, and the spleen also, to the creation or formation of red and white blood corpuscles for increased bodily nutrition; also for the *protection* of the individual against *microbic* diseases.

Can *you* tell me, or *you*, or *you*, how any stinking, measly microbe can "get by" all these scouts and masked batteries and bug-eating cannibals which the Creator has stationed in the different regions of the human body to guard the citadel of life?

No! The possible danger is not from without, but from toxins and ptomaines within.

Listen! On August 11, 1910, Mrs. D., 65, came to me for some repairs on a bridge made in 1890. Several times during the sittings she referred to the constant annoyance caused by an excessive deposit of tartar on the lingual surface of a partial lower plate, having to scrape it off with a knife once or twice a week during the twenty years she had been wearing it. For a number of years she had been a sufferer from arthritic rheumatism, finger joints all knotted and stiff, all former remedies having failed—for the past six weeks had used a rheumatic pill which had given her more relief than all former treatments. Incidentally she called my attention to the remarkable fact that all tartar had disappeared from the plate, with no further tendency toward new deposits since she had been taking these pills. I considered it a "hunch," and told her that every dentist, every physician and every pharmacist in the world had been, for years, hunting for that remedy.

They all know that any systemic remedy which would cause an excessive deposit of tartar to disappear from false teeth worn in the mouth, would have the same effect on tartar deposited on the natural teeth.

During the past five years I have tested this pill in a great many cases of rheumatism, arthritis, pyorrhea, constipation, headaches, etc., and developed some wonderful results. I found the pill contained no mercurials, no iodides, no bromides nor salicylates, but was purely a vegetable pill, 80 years old, compounded for rheumatism *alone.*

At that time Mrs. Mewborn's arm hung helpless at her side from rheumatism in the shoulder joint. At Mrs. D.'s insistence, I immediately started her on this treatment; one pill three times a day. You must know this patient was 65 years old, had attacks of rheumatism nearly every winter for years; chronic constipation, had lost a number of teeth from pyorrhea, gums and process absorbed around lower incisors, teeth loose, pus pockets, heavy deposit of tartar, and was extremely anemic, with nearly all the symptoms of Bright's disease. She seemed to suspect incipient Bright's disease, therefore would not consent to have a physician's examination.

Supplied with a box of these pills and an 8-oz. bottle of "Phillip's phospho-muriate quinine and iron compound," we sent her to visit a daughter in the country. After two months she returned, having gained 40 or 50 pounds in flesh, a perfect rosy complexion, every particle of tartar had disappeared from her teeth, leaving the exposed necks and roots absolutely clean and as sleek as if polished; no sign of pus or pockets, gums pink and firm and the teeth comparatively tight. She used the pills occasionally for two years, but she has not taken them since 1912.

At the present time I find the thirteen teeth remaining in the lower jaw, all of which were in the suppurative stage when the treatment was begun, nearly five years ago, are all perfectly tight, bone and gum has been reproduced and built up around the teeth nearly to the original gum line, only one pocket remaining between cuspid and bicuspid, and this with *timely* care should have been eliminated two years ago. She has had no more rheumatism; general health good.

In a great many other cases where I have had opportunity to watch results, the tartar in every instance seems to have been automatically detached, not dissolved, but thrown off in its solid form, and in every case leaving the exposed neck and roots of the teeth absolutely free from every spicula of tartar, with the appearance of having been highly polished.

This vegetable pill constitutes an alkaline treatment which neutralizes the acid and restores the alkalinity of the blood, thus facilitating the elimination of uric acid from the blood. This alkaline reaction on the secretin in the small intestine, in the same unaccountable manner, revivifies the osteoblasts and cementoblasts, causing them to rebuild alveolar process around loose teeth.

But the formula for this pill is owned by private parties, who decline to publish the name of the ingredients on each package, and guard their secret as they would hidden treasure. Parke, Davis & Co. manufacture the pills at $1.00 per thousand, which retail at $1.00 per hundred. After I had prescribed about twenty thousand of these pills, I insisted that unless they name the ingredients, *not the proportions*, on each package, I would have to abandon the use of the remedy. They ignored my ultimatum. So, I am a confessed violator of our code of ethics. What are you going to do about it?

If this pill carries the curative properties I am led to believe it has, I would be glad to have my experiments confirmed by others.

I am not yet ready nor willing to boost another man's game, after having discovered new fields for the expansion of his monopoly, by abandoning all to his exclusive exploitation.

642 Lauderdale St.

DISCUSSION

DR. L. G. NOEL: In the paper read last year at Signal Mountain, Doctor Mewborn put before us substantially the theory of Alexander Haig, of London, which charges excess of uric acid in the blood with being causative of nearly all diseases of malnutrition, "Such as obesity; all calculi, whether biliary, renal, pancreatic, salivary or serumal; diabetes, anemia, sciatica, constipation, gout, rheumatism, Bright's disease, Rigg's disease, asthma, paralysis, heart disease and death."

We quote the above list from Doctor Mewborn's paper, and to be perfectly just to him and the eminent author whose theory he seems to have accepted, we must admit that he does not say flatly that all the above diseases are *caused* by excess of uric acid in the blood, but we get this as the meaning of his opening statements in that first paper. He says: "There are three diatheses admitted, the scrofulous, or a predisposition to deposit tubercle; the cancerous, or predisposition to many forms of cancer; and the arthritic, or a predisposition to diseases caused by disturbed nutrition." (Query: Is not disturbed nutrition a characteristic of every disease?)

He says: "The term 'uric acid diathesis,' strictly speaking is only a subdivision of arthritic diathesis. Under this head are included all diseases due to faulty metabolism, such as—" then follows the list I have quoted above.

Doctor Haig's book has been out a number of years, has passed seven editions and has from the first been very popular. It was written in a style calculated to captivate the busy doctor whose stock of scientific knowledge is limited—to captivate, we may say, the rank and file of the profession. Doctor Haig's theory, so speciously propounded, was exactly suited to the wants of patent medicine manufacturers and the vendors of mineral waters and alleged mineral waters. Consequently these people gave wide circulation to his views by quoting him liberally in the literature advertising their nostrums, and thus these theories have been spread among the laity more widely perhaps than the tenets of any other medical book of the present century. It has been to the interest of the patent medicine men and the vendors of alleged mineral waters to keep these theories alive, and they have been lavish of printer's ink and money in attending to this duty. I pause to pass around a sample of the kind of literature to which I refer, "*The Uric Acid Monthly*," which is but one of many. Your offices have been flooded with them to such an extent that you have had to clean up every few months and make a bonfire to get rid of such stuff.

In 1898 I had some correspondence with Doctor Talbot, of Chicago, about these uric acid theories, called forth by a paper of Doctor Endleman's on "The Uric Acid Problem," which appeared in the *Dental Cosmos* at about that time. I asked my learned friend for his opinion, and I give you his letter which I take from an old letter file because it fits Doctor Mewborn's paper as well as if it were directly referring thereto: * * * "You ask me in regard to the paper of Dr. Endleman on the 'Uric Acid Problem,' in the October *Dental Cosmos.* My dear doctor, that is one of the papers incubated in the nursery of ignorance. He does not know that the uric acid theory as promulgated by Alexander Haig is rot. The better physicians of this country have discarded his theories because they have not proven true. I think my own experiments, ten or twelve years ago, had considerable to do with discarding the theories. Everyone has interstitial gingivitis; not three per cent. have uric acid. In talking with a noted specialist on urinary diseases, I asked him what he thought of the uric acid theory in gout. He said that he did not believe that there was much true gout in this country and that there was very little uric acid. I learned later accidentally that he was familiar with my experiments. The drug houses of this country are making millions of dollars by keeping alive the uric acid theory for the purpose of selling their drugs. The doctor knows nothing about this because of his ignorance with the latest scientific work. He brings no experiments to bear on his theories. A mess of ideas based on theories.

"I cannot do better than to call your attention to the splendid review of Alexander Haig's seventh edition on page 1097 of the September 26th *Journal of the American Medical Association.* My dear doctor, please read this article over three or four times, and you will get the latest views and my own combined.

"Why can you not prepare a paper on this subject for the coming meeting of the American Medical Association, Section on Stomatology?"

I have taken pains to produce the review of Doctor Haig's book to which he refers, and if it will not tax your patience too much, will read it also. "*** Concerning the origin of uric acid, which Doctor Haig says is manufactured in the kidneys, I give you the views set forth in the latest edition of Burchard, as follows: "While the bodily ejecta contain substances fairly constant in composition they are held to represent elaborations of cell waste rather than actual cell ejecta. For exampel, *urea* is pretty certainly derived from muscular tissue, yet is nearly absent in muscle, and is supposed to be due to the dehydration of ammonium carbonate in the liver. Lactic acid and ammonium carbonate have been experimentally shown to be probably combined into uric acid in the liver."

This brings us to Doctor Mewborn's second paper, which has just been read to you.

I find myself in full accord with Doctor Mewborn when he expresses a want of faith in the autogenous vaccine treatment as it has usually been practiced, and in his lack of confidence in the theories of Barrett and Smith announcing that the amoeba buccalis is causative of most forms of alveolar pyorrhea, and that emetin is the specific remedy for it.

Up to this date we have seen nothing either in the theory or practice of Doctors Barrett and Smith and their numerous disciples calculated to win our faith, and when the essayist says their theories were announced with indecent haste, we do not think his language too strong, for they did not, as pointed out by Doctor Talbot in the May *Cosmos*, wait until they had proven their charge against the amoeba by applying the law of Koch, i.e., growing the organisms in pure cultures and producing the disease by inoculation into the tissues of a healthy subject.

We have only to review the past as far as our own observation and memory extend to learn caution in accepting new theories in medical and dental practice. Our immediate past is strewn with the wrecks of discarded theories, and the costly but now useless apparatus we purchased with which to test them in our practice. Physicians and dentists have always been faddists, and probably always will be.

Doctor Mewborn thinks that the next and most promising new thing will be treatment by extracts from the ductless glands. We hope that we shall live to see the day when we may stop the falling of the teeth and hair by the use of serums and extracts, but many disappointments in the past must needs hold in check our too sanguine hopes. We must be sure that we really *see* what we see.

Pessimism and Incredulity are twin sisters, possessing no more allurements for me now than in my youth. I strive to keep my mind ever open to the reception of truth, and I care not a rap whence it comes; I shall receive it with joy whether it reach me through orthodox or other channels, but my past experience of bubble chasing makes me a bit cautious. I have already tried several tartar solvents, but found to my sorrow that they do not dissolve the hard deposits. I have been trying cures (?) for pyorrhea ever since the early eighties. I recall most vividly my enthusiasm over Robertson's remedy—and my disappointment I also remember.

Yet I rejoice that I still feel the lure of hope, and I shall be only too happy if Doctor Mewborn succeeds in overtaking a real remedy for falling of the teeth, gingivitis, Rigg's disease and pyorrhea, one and all. And it matters not if he extract the blessed cure from the veriest patent nostrum!

Let us rather praise him for his inquiring mind, his close observation, and his untiring spirit of research. These are the things that I have always admired in Doctor Mewborn, and for these and many other good qualities he will always be a guiding light, a shining example to the young men of the profession. It is this that I most commend in his paper.

BLOOD PRESSURE IN DENTISTRY*

BY E. I. MCKESSON, M.D., TOLEDO, OHIO

THE DETERMINATION OF BLOOD PRESSURE has become an important diagnostic and prognostic procedure in medicine during the past four or five years. As an evidence of the reliability of the information thus derived I may say, that today the insurance companies require it with every fair-sized policy. It often determines whether a policy is written or not.

It may seem on first thought that the dentist would derive very little benefit from knowing the blood pressure of his patients. It may be truly stated that many of the physicians who also treat your patients do not have a sphygmomanometer, and know practically nothing of its value or its use. Nevertheless, it furnishes definite evidence of such diseases as arteriosclerosis, which may terminate in a "stroke" of apoplexy anywhere at any time and without warning; nephritis, which is often associated with certain conditions for which the dentist is consulted; lead poisoning, also associated with dental difficulties; tumors of the brain associated at times with pains about the teeth with difficulty in vision, dizziness, etc.; severe asphyxia; certain valvular heart diseases which may have some influence upon the life of the teeth. These conditions are all associated with high blood pressures.

Then we have tuberculosis, acute infections and contagious diseases, hemorrhage and surgical shock as the most prominent causes of low blood pressures.

We also have people who imagine they have heart disease and are unfit (as they think) to take an anesthetic, who might mislead the dentist until the blood pressure is taken.

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*Read before the Northern Indiana Association, 1914.

I am not so sure but that some obscure conditions in the mouth might be cleared up if the dentist knew more about the patient's condition generally.

It is not my purpose, however, to discuss the whole field of usefulness of blood pressure determinations in its relation to dentistry, but to devote the time allotted to this paper to four phases of the subject: namely:

1. A brief consideration of the salient points on the physiology of blood pressure.
2. Pressures indicative of serious systemic disease requiring special attention and preparation for the safe management and treatment by the dentist.
3. The influence of anesthetics on blood pressure.
4. Shock and its blood pressure signs.

Blood pressure represents energy in the arterial blood stream resulting from muscular contraction or work. As we have two forms of energy —potential and kinetic—so also we have two blood pressures—diastolic and pulse pressure. The diastolic pressure is the lower pressure and is in the form of potential energy stored in the arterial wall by virtue of its elasticity. It is largely the measure of the peripheral resistance, or the pressure the heart must develop within the left ventricle before the valves will open into the aorta.

The pulse pressure, on the other hand, represents kinetic or moving energy. It is the force used in *moving* the blood, after the aortic valves are opened. Like hanging a weight on a pump handle, if the weight is sufficient only to balance the water column above and below the sucker, no water is drawn; but if the weight is increased, we obtain a stroke of water which is comparable to a stroke of the heart.

In making a determination of the blood pressures we first obtain the maximum or systolic pressure; that is, we obtain the pressure developed at the *end* of heart contractions; then we find the minimal or diastolic pressure or the pressure in the artery just at the *beginning* of the heart contraction, the difference between the two is pulse pressure or heart stroke. If the maximal pressure is 120 m.m. Hg and the diastolic is 80 m.m. Hg, the difference between them, 40 m.m. Hg, represents the pulse pressure developed as the blood-moving force. The pulse pressure is normally one-half the diastolic. These are the normal figures for an adult from 20 to 25. As we grow older the pressure increases slightly.

It must be clear then, that the diastolic pressure largely represents vascular conditions, the pulse pressure, heart conditions; and the maximal or systolic pressure, being a sum of the two, represents both together.

Inasmuch as the systolic pressure is a sum of both the diastolic and pulse pressures, it is not as reliable in diagnosing a pathologically high or low pressure as a study of the two pressures individually.

What constitutes a dangerously high or low pressure?

Before answering this question we should call your attention to the important influence of respiration on blood pressure in which we will find the cause for the greatest normal changes. We can then designate pathological pressures.

The heart and chest acting together as pumps are quite similar to a two-phase pump in mechanics. The chest develops a suction during inhalation, which not only draws air into the lungs, but draws blood from the low pressure veins leading into it and delivers an increased quantity of blood at the heart. At this moment the heart, situated within the chest, responds to this same suction or negative pressure by filling fuller. The capillaries in the lungs during inhalation are less tortuous, and because of the negative pressure, dilate, thus holding more blood. Now, the net result is a *fall in arterial blood pressure.*

When exhalation takes place these conditions quite naturally reverse. The negative pressure within the chest during inhalation becomes a positive pressure; the increased volume of blood in the lungs is now reduced like squeezing a sponge, and the heart is momentarily aided in contraction to force the increased volume of blood into the aorta, so arterial blood pressure then rises, so that with each breath the blood pressures change.

Normally, this respiratory variation amounts to about 5 m.m. But in sleep, when there is always more or less obstruction to free respiration, the intra-thoracic pressure presents greater fluctuations which are communicated to the blood pressure so that it may amount to from 5 to 15 m.m. variation.

Physiologically the greatest increase of blood pressure occurs during the act of straining at stool, with the glottis closed, and during expulsive efforts of women in childbirth. Here the rise is 30 m.m. to 60 m.m. During the large inhalation which invariably follows, a fall of 10 to 20 m.m. below normal occurs and after a few breaths, returns to the normal fluctuations.

These may be considered the physiological limits of blood pressures. That is, an adult 20 to 25 whose normal systolic pressure should be 120 m.m. Hg and diastolic 80 m.m. Hg, with a pulse pressure 40 m.m. Hg, under no circumstances should show a systolic pressure more than 30 m.m. above or 20 m.m. below this standard for his age without signifying the existence of well-defined pathology requiring further questioning and investigation. Under appropriate treatment in conjunction with his physician, if needed, the blood pressure should indicate the prognosis and progress toward arrest or improvement of the disease. A high diastolic pressure of 120, for example, indicates that the disease is affecting the arteries, that the peripheral resistance is too great, which in time will affect the heart from overwork.

A pulse pressure greater than one-half the diastolic indicates that the heart is required to compensate for a leaking valve or some other defect by putting out a greater stroke. In this connection, also, the pulse rate is a valuable aid in obtaining an idea of the amount of overwork done by the heart and should always be noted.

Physiologically the faster the heart acts, the greater the pressure should be, but in conditions such as shock we shall see how this rule does not hold.

About seven years ago I had a patient who was suddenly paralyzed on one side of the body, due to an attack of vomiting on the second day after an operation done under ether anesthesia; I was aware of this danger at the time of the operation but did not look for it after the operation. A subsequent attack a year or so later resulted fatally.

This case points out the necessity of having at least three cases with high blood pressures carefully prepared as to diet, cathartic and clothing before administering any kind of treatment in which there is danger of vomiting, such as in the administration of an anesthetic. Or, what is still better, so prepare *all* cases.—No solid food, cathartic and loose clothing before anesthetizing. However, the use of blood pressure as a guide to the proper percentage of N_2O and O in anesthesia as recently advocated and published is impossible and based on false conceptions. Blood pressure *will not* indicate whether to give more or less oxygen; there are plenty of *reliable* signs for the control of anesthesia.

We now come to our final topic for consideration, viz., the influence of anesthetics on blood pressure.

There is no anesthetic with which I am familiar that produces and sustains an increased blood pressure. Such a condition is physiologically opposed to the very mechanism of anesthesia.

In the first few minutes of ether during the unrest of introduction and until tranquil anesthesia is established, there may be a (but not at all constant) rise of blood pressure, apparently due to the accelerated heart rate and struggling followed in nearly all cases by a progressive fall to the end of the operation. This fall affects both diastolic and pulse pressures, and if continued longer than three hours frequently results in profound shock with very low pressures.

Chloroform; somnoform, ethyl-chloride, etc., act largely as ether, except that the fall in pressure is more abrupt, reaching dangerously low pressures earlier in operation.

Concerning N_2O-O anesthesia there has occurred a confusion in literature. We see in print repeatedly that N_2O produces a rise in blood pressure, also that N_2O-O does the same thing and, possibly, on the same page, that the rise is due to asphyxia.

After eight years' work making blood pressure records as a routine every five to ten minutes during operations, comprising about everything done in modern surgery, a very large majority of which have been done under N_2O-O anesthesia, I find that:

1. N_2O-O does not cause a rise in blood pressure.

2. That asphyxiation may increase blood pressure.

3. That a deep rose color (purplish) often seen in N_2O-O anesthesia is an insufficient grade of asphyxia to produce a rise in blood pressure above the normal in more than one per cent. of cases, and even these not above the limits of safety for the patient; such a rise occurs in the first few moments of anesthesia and immediately returns to normal or below.

4. With ether in excitement with the same case the rise would not be less.

5. That under N_2O-O anesthesia the blood pressures have a greater tenacity for their normal readings in the particular patient than under any other form of anesthesia including local.

6. That in very prolonged and extremely traumatized operations the blood pressures fall under N_2O-O, reaching shock values only as a result of the operative procedure, or the disease affecting the patient.

When N_2O is given *without oxygen* anesthesia develops in from thirty seconds to three minutes; asphyxia, however, is quite advanced at seventy seconds, and before three minutes the patient is usually in spastic apnœa. It is under *these* conditions that N_2O obtained the reputation of causing a rise in blood pressure, but with the addition of oxygen to prevent asphyxia, blood pressure is rarely affected by this anesthetic.

Without going into the large and interesting subject of shock, I wish to bring out the important points in its diagnosis and prognosis.

1. That shock is a depression characterized among other variable symptoms by the invariable symptoms of a low blood pressure.

2. That it may be and is often caused by fear or emotion, hemorrhage, repeated stimulation of the vaso-motor centers through afferent or sensory nerves, and is generally associated or accompanied by over ventilation or rapid breathing, etc.

3. The diastolic pressure usually imitates the change in pressure, by a fall lasting but a few minutes when the pulse rate increases and brings it up again.

4. The pulse pressure decreases in proportion to the degree of shock and heart exhaustion.

5. After a pulse rate of 120 is reached a further increase of speed will not compensate for the widening of the "arterial bed," but the pressure will fall in spite of increased rate, probably because the heart is too quick to fill properly.

6. That these pressure changes come on gradually during an operation with the patient under anesthesia when the mental element is eliminated. The time varies from fifteen minutes to two hours.

7. That a pulse pressure of 15 m.m or less continued for more than half an hour and associated (in an otherwise normal patient) with a diastolic pressure of less than 70 m.m. will generally result fatally.

8. Shock once well established under an anesthetic usually persists until recovery of consciousness at least. In less favorable cases it persists longer and is the more dangerous the longer it exists.

At this point I wish to read a few of the unusual cases taken from the records of L. L. Sheffield, D.D.S., Toledo, Ohio, who for a year or so has been making observations of blood pressure in his dental practice, and who has kindly allowed me to use some of his data:

Case 1—Mrs. S., aged 60, apparently well preserved, would be taken for about 46. Her blood pressure readings were systolic 74, diastolic 54, pulse pressure 20, pulse rate 64. The time of reading was 9:38 A.M., taken in the sitting posture.

I had intended using N_2O-O, but after the reading, which seemed to be unusual, I proceeded without, made exposure, and with pressure anesthesia, using the tiniest drop of chloroform, anesthetized and removed the pulp in a lower bicuspid. I then injected the tissues around a root with the one per cent. solution of quinine-urea-hydrochloride, using one syringeful. At the third puncture around a similar root on the right side the patient suddenly fainted, respiration ceased, there were no audible heart beats and no perceptible pulse; the lips became a purplish-blue, dappled with yellowish-green.

Artificial respiration was resorted to, smelling salts were used, then an amyl nitrite capsule was broken and applied during a portion of two inhalations. A few seconds later pulsations at the wrists were perceptible and respiration continued unassisted.

The patient remained in the operating chair about twenty minutes, then laid on the couch and slept for one hour; in 15 minutes during her sleep her color came gradually back to normal. Two days later a phone message came saying she could not keep an appointment, being confined to the house with lumbago. Later, however, she kept appointments and had the roots extracted without taking anything and without an unusual symptom.

Case 2—Miss A., girl, aged 13, about a month apart showed the following readings:

Systolic	100	70	98
Diastolic	50	50	68
Pulse Pressure	50	20	30
Pulse	88	78	78

At the age of 5 or 6 this girl had scarlet fever and endocarditis with valvular heart disease since. She apparently forgets to breathe, when the blood pressure generally decreases until there is a large, full inhalation, which is followed by a rise of blood pressure. And so it continues to be high or low according to the character of respiration.

Case 3—Mrs. P., aged 60. Apparently well, showed a reading of 200, 85, giving her a pulse pressure of 115. But before purchasing the sphygmomanometer I had administered N_2O-O to this patient, had complete anesthesia, and made an exposure of a pulp. After learning the conditions of the blood pressure the use of N_2O-O was discontinued. It was found that she had nephritis.

Case 4—Miss P., daughter of the above, age about 28, reading showed 76, 64, 22. Did not use N_2O-O on this patient. She seemed not very strong, and at the next sitting I learned that she was sleeping on the porch. At different times her mother has indicated to me that the daughter's health was extremely variable.

DISCUSSION

Dr. M. E. Le Galley, Lafayette: When I first read this paper over, I didn't know where to begin to discuss it. In the first place, I do not know very much about the subject. But this is certainly a paper that is worth a great deal to us. The first thing that struck me in the paper was the fact that the doctor said if we were not sure, many of our obscure conditions might be cleared up if we knew more about the general condition of our patients. No doubt that is true. The more we know about the general conditions of our patients, the better dentists we will be, because people are beginning to realize now, although they haven't always, that the teeth are a part of them, just as much as a finger is a part of them, and that any bad condition in the teeth affects the general conditions, just as general conditions may affect the teeth. So the more we know of general conditions, the better prepared we are.

One of the authorities on this subject says that in all heart conditions we find the blood pressures falling. I hardly believe that is true, when heart conditions are first developing, but I believe in the end, in heart conditions, we will have low blood pressures always. When some heart diseases are first developing, we will have high blood pressure, and in any of the cases where the general symptoms point to some disturbance that it is hard for us to tell, we had better take the blood pressure, or have it taken, and through that knowledge we may be able to tell how to proceed. It is well to be on the safe side. A man giving anesthetics would be more deeply interested in this phase of work than the man who is not using anesthetics. In any case we will be prepared to know what to expect, if we have the readings before we begin and while the anesthetics is going on. I read a paper written by a man who was constantly giving anesthetics, in which he stated that he did not deem it necessary, when the patient had to be given an anesthetic, to make a thorough examination of his condition He said, "You must give the anesthetic any how. Just be prepared for anything that may develop, so that when anything comes up you are ready to take care of it." Now, if you were going to cross a bridge, and there were twenty pounds of dynamite under it, and you knew if you hit the cap just right the dynamite would go off, you wouldn't run and jump on that. It is the same way with the anesthetic. If you know there is something there, you will be cautious, just as the man would on the bridge. So I think the words of the essayist are good ones, and we should always be prepared on our cases.

Dr. Max Ruge, Valparaiso: I have come to practically the same conclusion that Doctor LeGalley has, that we must be on the safe side all the way through. When we get cases that are a little doubtful, if we have had experience with anesthetics, we can tell those doubtful cases immediately. I think in those cases we should have the blood pressure taken and look for pathological conditions, and finding them, they should be taken care of before the anesthetic is given. My experience has been entirely from a dental point of view, and I want to say that by this preliminary preparation of the patient, Doctor Crile's method, by preparing your patient, having him mentally in the proper condition, carrying out your line of suggestion, having the co-operation and confidence of the patient for all dental operations, I believe we are safe in going ahead, because shock does not develop in so short a time to the degree that it would be of a serious nature. Doctor McKesson has said shock will develop, and it will go on for several hours. I spent some time with Doctor McKesson and we took blood pressure tests, and with a little fall of blood pressure or a little rise, he said there was nothing alarming. I arrived at the conclusion that for all short operations we are safe, providing the mental condition of the patient is right when we start, but we must carry out some preliminary things regarding an empty bowel, empty bladder and empty stomach. If I have a case that is doubtful I make an appointment for the first thing in the morning. I see that the patient has had a good night's sleep and that all those things have been carried out. I have had only one case that scared me to death. Every time I talk about that case I begin to shrink a little bit, and, I am shrinking now.

Another important factor in the use of N_2O-O is to start the anesthetic slowly, and get enough oxygen in it so that the patient does not have so much tendency to shock. The idea is to slip the patient into the stage of anesthesia slowly, not force them too much in the early stages. After you get the patient properly ventilated and the rebreathing back all right, it is likely to be smooth sailing in dental cases. I do not think Doctor McKesson ever worries about a dental operation, but in these long operations, loss of blood, and other things, are important factors. I believe there is no danger, if these rules are adhered to. They minimize the chances of shock.

I wish to say a word regarding a certain class of patients we have come to us. A fellow who thinks he must take a few drinks before a dental operation. They are a hard bunch of fellows to anesthetize satisfactorily, unless you carry out preliminary preparation. I had a case a couple of weeks ago, a fellow who wanted some roots taken out; they were practically nailed in. They were so firmly fastened that that is a sort of an expression we use. He was a husky fellow, and had had about five or six drinks of whiskey; when they have that much they come ready for trouble. I couldn't anesthetize the man at all; I told him he would have to go home. I didn't carry out preliminary treatment; he just came in, and I thought I would get through with him then. But upon his return in the morning I gave him a hypodermic and had him lie on the couch, and when we got started on him he went through in good shape. In that class of cases you will find this preliminary preparation of the patient is a most important factor.

Another class of patients that always worried me until I spent the few days with Doctor McKesson is the big, heavy lifter, the big chested fellow; they are usually heavy breathers with well developed intercostal muscles. Doctor McKesson advised backing them in with an increase of oxygen, etc. I had one case that I couldn't do anything at all with, and I handled it in that way and it worked out nicely.

I have a record on a case here that I would like to read. This is a case of a man about sixty-three years old. He weighed 230 pounds. He was a physician and knew all about anesthetics, and he knew he couldn't take chloroform or ether. He came to me and asked me to give this anesthetic. I hesitated, because everything showed that any anesthetic would be contraindicated. He was suffering from endocarditis; the second bicuspid was involved; valves with chronic dilation; had suffered from several attacks, including an extreme varicose condition of both limbs; operation for removal of veins in lower extremities. He took the anesthetic satisfactorily for almost twelve minutes, then the anesthetic effect seemed to wear off unless I kept the dial down to between five and six per cent. We worked along at that for twenty-five minutes, and then everything stopped; the fellow was almost black. But by forcing a little rubber tube such as Dr. McKesson suggested having handy—you have a swelling of the muscles of the throat and all those things—into the throat, we forced oxygen in and we came out fine. He was mad because he felt the last two or three stitches. If that fellow wants to take it again, I am going to send for Dr. McKesson, for I believe in keeping out of trouble. I believe blood pressure tests taken at regular intervals should have told of the approaching danger in time to avoid it.

DOCTOR MCKESSON (closing): In regard to heart conditions in relation to blood pressure, we may have high pressure or low pressure. In an athletic heart we will have high pressure because the heart has developed high pressure in order to overcome certain conditions that the patient imposes on his heart. A patient with compensated aortic lesions, where the blood runs back into the ventricle from the aorta during the heart rest, will have high blood pressure, because the heart must double up its stroke in order or keep the blood moving, because so much runs back into it. In mitral conditions, where the blood runs back into the auricles from the ventricles, we have a low blood pressure, because the heart has not power, as a rule, to force the blood out. And so we must take into consideration the relation of the pulse rate to pulse pressure and diastolic pressure in making our diagnosis. While I have just merely touched on it, you can get a very elaborate description of those things in ordinary books on blood pressure.

DOCTOR JACKMAN: How does the blood pressure vary with age in normal hearts?

DOCTOR MCKESSON: From twenty to twenty-five, these are the normal pressures; diastolic, eighty; systolic, 120, and pulse pressure half of the diastolic, forty. For every two years you add 1 mm. For instance, at thirty you should have a systolic pressure of about 122 or 123; and at forty, between 125 and 130; at fifty, between 130 and 133. We almost always, when we get to fifty, have a little hardening of the arteries, and there is a little larger increase. If absolutely normal at fifty, you will have that sort of blood pressure.

OUR RESPONSIBILITY IN NEGLECTING AND TREATING DENTAL MALPOSITION*

BY DR. VARNEY E. BARNES, CLEVELAND, OHIO

RESPONSIBILITY HAS BEEN DEFINED AS: The state of being responsible, answerable or accountable. An authority quotes: "We measure *responsibility* not by the thing done, but by the opportunities which people have had of knowing better or worse."

Our dental societies and colleges, as well as dental, scientific and medical literature, all offer opportunities of a technical knowledge for which we are more or less accountable to humanity, to our profession and to our Maker.

The establishment of every scientific fact which may be related to the field of dentistry, places a greater responsibility upon the profession, our educators and by no means least upon our dental program builders.

In order that we may better recognize the responsibility existing as indicated in the title, it will be advisable to present the normal dentition, or as near the normal as is possible, then show how this normal may be imitated or approximated through a rational treatment. Contrasted with this will be the evil effects of neglect or of incorrect treatment.

Very tersely, the normal may be defined as "an entire absence of deformity," or as a "perfectly regular, symmetrical standard type." In dental formations this normal should originate in a healthy child with the proper functioning at birth of the three great systems of respiration, circulation, digestion and assimilation and excretion. Prior to this there should certainly be normality of parents and of pre-natal development.

The maxillary and mandibular bones should develop rapidly after birth in order that breast feeding may be maintained and that the temporary teeth, whose crowns are calcified in greater diameter at birth, may rapidly diverge from their cramped positions and prepare to erup byt

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*Read before the Lake Erie Dental Society, 1914.

piercing the gums without lateral contact with other teeth. The convex mesial and distal surfaces of all teeth, the sharp and pointed cusps, the greater coronal and lesser cervical diameters, indicate that this spacing of the teeth and piercing of the gums is the normal eruption which should be painless and unaccompanied by any nervous, muscular or digestive disturbance.

The eruption of the temporary teeth should be complete at approximately the second year. The spaces between the molars may close prior to eruption of the first permanent molars but the spaces distal to cuspids and laterals should increase so that at or before the fifth year the temporary tooth, plus its distal space, will be greater than the corresponding succeeding permanent tooth. This agrees with the calcification of permanent centrals, laterals and cuspids whose crowns have their complete width development between the fourth and fifth years. The spaces distal to centrals increase after the fifth year prior to the eruption of the permanent centrals which releases the laterals and provides the full width development of the dental arches anterior to the first molars *as early as the sixth to seventh year.* This width development should have associated with it a corresponding development of the superimposed nasal and internal facial structures, the subsequent developments in size being in the vertical and antero-posterior dimensions.

It is not necessary to give the tables of eruption, but it may be advisable to note that the *lower cuspid should erupt at about the ninth year, the upper at about twelve.* Also the greater width of the second temporary molar over the second bicuspid is evidently the wise natural plan to allow this second bicuspid to erupt at about eleven years, while development of the oncoming second molar presses the first permanent molar forward, and thus allows an easier eruption of the second molar and finally the third molar.

This normal development should give a full rounded conformation to the face which is changed later to the proper mature contour by the subsequent greater cranial development.

The normal child begins to eat solid foods when the molars are erupted and in place for mastication. At two years, when all the temporary teeth are in position, he should be eating solids and the liquids should be only supplementary foods. Food at this time must require chewing and salivation before it can be swallowed- this in addition to aiding the digestive function, helps the development of the skull through the muscular action and functional stimulation.

Dr. Lawrence Baker's experiment has proved this. He ground the teeth of rabbits on one side of the jaw so as to prevent occlusion. The skulls of the rabbits so treated showed unsymmetrical development and softened bone on the side where the teeth were ground, whereas the side where the teeth performed their function was well developed, and the bone was hard as it should be.

The dental deformities which can be corrected or ameliorated by stress applied through the teeth are generally those in which maxillary and mandibular developments are deficient in width, antero-posterior and vertical dimensions or combinations of these in which the mandible or maxilla show a greater deficiency in one or the other. Most of these deficiences may be expressed as too small a bone development for the teeth provided. These are the most serious conditions because they involve not only stress eruptions or general impactions and consequently nerve irritations, but also because they result in malocclusions, indigestion, speech defects and mouth-breathing. They are associated with nasal stenosis, enlarged tonsils, deficient sinuses and defective functioning of the ductless glands, particularly the pituitary body.

There are other deformities, such as cases of teeth too small, teeth missing, supernumerary teeth, dentigerous cysts. The small teeth and missing teeth usually are not serious or likely to affect the general health except as they may interfere with mastication. The cysts may require a cutting operation, but the supernumerary teeth often cause disturbances through the nervous system by their impactive pressures.

Because so many of these defects, which are associated with or result from deformities, have been benefited or apparently entirely cured by a proper orthodontic treatment, we have had to conclude that orthodontia produced not merely better appearances and better health through improved mastication and respiration, but also improved health and mentality through the expansion and development of the bones of the internal face.

The possibilities of this treatment are so great and the beneficial results such as cannot be obtained by other surgical or medical means, that orthodontia must take rank as one of the greatest curative and preventive sciences.

Since there are such great possibilities in the prevention and correction of dental deformities, we must acknowledge that there is a correspondingly great responsibility in neglect of treatment.

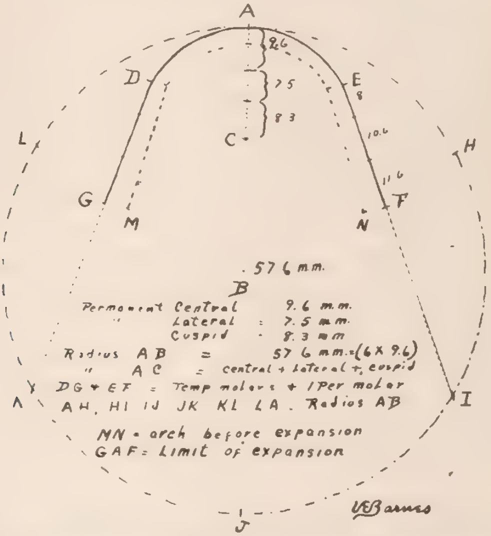
In the abnormal or defectively developed child we will almost always find the bone formation too small for the teeth provided, and associated with this many of the defects above mentioned. The child will probably have a history of parental dental defect, pre-natal and post-natal malnutrition, malnutrition, bottle-feeding, difficult teething, irritability or nervousness, indigestion, adenoids and large tonsils, nasal stenosis, defective tooth structure, crowded temporary and permanent teeth, deficient spacing of the teeth and mouth breathing.

The first dental treatment indicated for such a child is the saving and restoring of defective teeth, then comes the expansion of the arches and this should be done from the fourth to the sixth year.

The width development of the jaw has been shown to be complete at or before the seventh year and since this is the first complete development to occur in the normal mouth, the lateral expansion *must* be the first treatment in the defective mouth.

If the spaces are not evident in good size between the temporary teeth, as heretofore mentioned, at the fourth to fifth year we may be certain that lateral and anterior expansion is required unless the permanent teeth are exceedingly small, which occasionally happens, a radiograph or the first tooth will be the indicator.

Large teeth erupting into too small an arch or interfering with one another are usually certain to take a position or to form a dental arch lingual and posterior to the normal arch position, on account of resistance met; therefore our imitation of the natural arch development must artificially open sufficient spaces between the temporary teeth by means of a direct lateral pressure which will not force any of the teeth backward. This lateral expansion will release the permanent teeth so that they can erupt sooner and can be easily guided into correct position before the alveolar bone forms; with this treatment practically all posterior pressure can be eliminated.


A
2.6
7.5
8.3
C
D
E
8
10.6
11.6
L
H
G
M
N
F
. 57.6 mm.
B
Permanent Central 9.6 m.m.
" Lateral : 7.5 mm.
Cuspid · 8.3 mm
Radius AB = 57.6 mm.=(6 X 9.6)
" AC = central + lateral +, cuspid
DG + EF = Temp molars + 1 Per molar
AH, HI IJ JK KL LA. Radius AB
I
K
MN = arch before expansion
GAF= Limit of expansion
J
VEBarnes

Theoretical limit of expansion calculated from mesio-distal diameters of the teeth
(From a case in practice)

The appliances used to produce this expansion must mass the teeth on one side against those of the other and move them bodily so that the bone itself is moved in the maxilla, the lateral halves separating at the median suture. The split plate and some forms of the spring crib appliances have opened the suture but the painless and well-controlled pressures are best applied either with jack screws high up in the palate or with rather heavy springs working in vertical tubes, so their stress is applied at a tangent as the springs move outward. The pressures are rather heavy at first, so as to quickly open the suture, but at all times this must be painless to provide a physiological and not a pathological action. After the lateral expansion has been attained the pressures may be diminished if desired and the antero-posterior and vertical developments are to be stimulated, guided and pressed toward the normal in occlusion, contour, and harmonious relation of jaws and the rest of the skull. The limit of expansion is a theoretical arch similar to Bonwill's in which the anterior arc is calculated from the widths of central, lateral and cuspid as a radius and the sides of the arch from a radius of six times the width of the central incisor. (Illustration.)

The lower arch expansion is necessarily slower and it is to be enlarged to the upper as the limit.

Both arch expansions should provide room anterior to the temporary molars for eruption of centrals, laterals and cuspids, and the second molar space must be kept open until the second bicuspid erupts, so that the first permanent molar will shift forward and release the second permanent molar. If this space is not maintained as indicated, the molar will not move forward —the second molar will be compelled to move upward and *backward*, which is not normal and which will produce that irritated and extremely sore fold of gum tissue which is so often noticed over second and third molars. This encroaching of the first molar on the second's space and the second on the third molar's space, along with the posterior placement of all of the teeth in trying to erupt into too short and too narrow an arch, explains the formation of third molar impactions. With this idea of the formation or aggravation of impaction clear in our minds, we should certainly be exceedingly careful that our attempts to treat or relieve deformity in the anterior part of the mouth do not cause or aggravate impactions or deformity in the rear of the mouth.

Orthodontic treatment may have to be continued for years with alternate rest and work periods, depending upon the progress and the rapidity with which the permanent teeth erupt into the spaces artificially expanded for them. Very often the permanent teeth will erupt rotated, on account of their formation and long detention in the cramped quarters of the deficiently developed jaw. The more difficult the case the more often will this complication occur. This condition cannot be foreseen except by X-ray examination, and in undertaking preventive orthodontic treatment, these possibilities are to be anticipated. Thus the actual care and responsibility in the case may extend over a number of years because the development in the antero-posterior and vertical direction is necessarily slow. The actual time spent in treatment when the treatment is preventive, is usually less than for the purely corrective treatment. The responsibility of the operator, therefore, continues in all cases until the third molars erupt, or until adequate provision is made for their eruption, or correct occlusion established.

The widely used and popular appliance consisting of an arch wire controlled by nuts and threads and resting in horizontal tubes soldered to molar anchorage bands, is a great factor in creating or increasing third and second molar impaction. We must remember that the pressure applied to press teeth forward and laterally, in this appliance, is sustained by the molars, which in turn must necessarily move backward. If this backward movement is desirable, no harm will be done but we must be certain that it is advantageous and that it is not creating impactions in the rear of the mouth, while the anterior teeth are so nicely arranged.

The recently marketed so-called new appliances of Angle & Young do not differ materially in their posterior anchorage from the older appliances which are causing so much impaction; they are sustained by molar and sometimes by molar and bicuspid anchorage, but the pressure is anterior and posterior, just as it is in the other dangerous apparatus. Recall Newton's law—"Action and reaction are equal and opposite in direction." then see to it that the application of orthodontic pressure uses this law for good effect in all directions.

Since it is possible by orthodontic pressures applied through the teeth and jaws to so mold the internal face as well as the skull that respiration, circulation, development, speech, digestion, vision, the nervous system and the general health are benefited materially—what must we conclude as to the responsibility of the operator who institutes this treatment? *What* shall we think of the man who ignorantly, or carelessly, or arbitrarily, applies pressure in an endeavor to merely regulate a few teeth or to expand a dental arch without considering the after-effects which may be the result of careless treatment?

Now let us consider neglect. Over 95% of the people of our civilization have malocclusion in greater or lesser degree, and associated with it many of the defects which can be materially benefited or cured by a rational and scientific orthodontia, or which can be largely prevented by the preventive treatments of expanding and harmonizing the jaws at an early age.

Undoubtedly less than 1% undergo treatment for dental and associated deformities. Why?

Some question the necessity for the corrective treatment, saying that these deformities often correct themselves; *they do not do so.* Where, in all of our literature is there a single bit of evidence proving or even tending to prove that these defects correct themselves? Teeth do occasionally *apparently straighten into the arch line*, but when they do so it is into a too narrow arch and that tooth takes its new position at the expense of the posterior position of a tooth farther back in the mouth. This is reflected backward from tooth to tooth until we have impaction of third molars—and we know what an evil that is.

Some dentists cannot see any but the greatest defects and of them I am tempted to quote, "Eyes have they but they see not."

The necessary expense of the corrective treatment does unquestionably prevent very much orthodontia and it is in this direction, along with many other problems, that it seems up to our orthodontists to aid humanity by providing somehow an economical and satisfactory way to aid the greatest suffering associated with dental malpositions.

The commonness of dental irregularity in the deciduous teeth and the evidence of the deficient spaces between these teeth as a definite indication of irregularity to follow in the permanent teeth, has been noted repeatedly in our literature for many years past. Nevertheless there are still many dentists who do not seem to know this or who disregard it or who do not believe it. The facts have been put before them, the responsibility is theirs—so also is the opportunity of warning, treating or referring their patients. It is the plain duty of every dentist to advise his patients as to what he needs in dental treatment and it is likewise his duty to warn that patient of the evils he is liable to suffer if dental care is neglected.

If this effort has succeeded in awakening the responsibility of any who have not felt it as they should, I shall feel that my labor has not been in vain. I have felt the great responsibility in writing such a paper—there is so much that might have been said and what has been written might have been put more simply and clearly, but I trust that what has been done will stimulate all of us to renewed effort as it has the writer.

STANDARDIZING THE AMALGAM FILLING

BY WALTER G. CRANDALL, D.D.S., SPENCER, IOWA

(*Continued from page 579 July Dental Summary*)

III. MANIPULATION AND INSTRUMENTATION

Starting with good cavity preparation and a good alloy, it is of equal importance that the succeeding steps are taken with equal care. An amalgam is a partial solution of an alloy in mercury and the state and condition of this solution have a decided effect on the final result.

We have insisted on an alloy made and tested by exact methods and we should be equally cautious about the mercury with which to dissolve it. Select the purest mercury obtainable, from a dealer with a reputation for such material Much of the mercury offered contains traces of metals which, if added to our alloy, might change its balance and destroy the permanent usefulness of any operation for which it is used.

A suitable alloy scales, fairly accurate, should be used to weigh out the alloy and mercury. A series of micrometer tests, using a variety of alloys, conclusively proves the value of using the correct ratio of mercury. Those alloys which are carefully made, so that the solution of metals is perfect, are not seriously affected by a large surplus of mercury, if the surplus is quickly removed. Because of the thoroughness of the solution, the metals are carried off in very nearly the same ratio as that in which they are combined. It is, however, careless and unscientific to abuse accurately balanced alloys in this way. If the balance should be very close, there might be some danger of expressing an excess of one of the alloy metals and seriously impairing the value of the alloy.

An excess of mercury will cause a shrinking alloy to shrink more, an expanding alloy to expand excessively, and a closely balanced alloy to first shrink and then expand. This is obvious because of the fact that there is sufficient mercury present to produce all the action possible from the metals, while if the mercury is limited, it can only produce action on the small amount of alloy dissolved and must then cease.

The dual movement observed in the balanced alloy with excess of mercury is probably due to the fact that the tin is first acted upon, because it is more soluble in mercury, and shrinkage is produced and that later the silver takes up the surplus mercury and causes expansion.

A small surplus of mercury is quite necessary for thorough amalgamation, but this surplus should always be worked out as much as possible before the filling is complete. To avoid the sloppy excess which weakens the amalgam and produces excessive movement, both alloy and mercury should be carefully weighed with a balance which is fairly accurate.

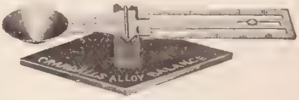


Fig. 13—Alloy balance for weighing out alloy and mercury

The weighing will also prove a decided economy, as one soon acquires the ability to judge the approximate amount required to fill the different cavities, while it would be impossible to guess this amount when pouring it from the container. We should plan to have plenty of material for each filling, without repeating the mix, but it is useless extravagance; especially in the case of large fillings, to have two or three times the amount required.

We should know the ratio of mercury required for the alloy we are using. If it is printed with the general directions, pay no attention to it, as it is quite impossible to make all batches of alloy so that the proportion of mercury required is the same. If the manufacturer has not taken the pains to determine the proper ratio, it is best to make a few trial mixes to establish the ratio which best suits our working ability.

There should be sufficient mercury so that the alloy, when it is ground in the mortar, under pressure of the pestle, will take it up and make an amalgam about the consistency of putty, which will be an easily workable mass in the palm. We find that to make the best amalgam, there should always be a slight excess of mercury which should be expelled as manipulation progresses.

When the desired ratio of mercury and alloy has been established, it will hold good for all mixes of the same batch of alloy, with the possible exception of extremely large mixes in which the mass of amalgam is so large that it becomes difficult to grind it as thoroughly as the smaller amounts.

Many methods are employed for mixing alloy and mercury. Perhaps each has some advantage for a certain variety of alloy. The accurately tested alloys have proved most successful when ground in the Wedgwood mortar. Nearly every office is equipped with this most useful working tool, but the pestle which usually accompanies it is worse than useless. The pestle should be so shaped that it will fit into the contour of mortar, and large enough to cover most of the floor, so that a large part of the alloy will be ground continuously. The handle of the pestle should be generous in size to permit a firm grasp.

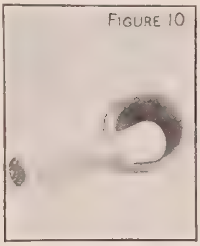


Fig. 10 — Mortar and pestle. The size of the pestle and the grip make amalgamation a quick and easy process.

When new, the Wedgwood porcelain is somewhat rough and porous and will prove to be a source of considerable annoyance, as the amalgam will adhere to it and is difficult to remove. Constant use will overcome this difficulty as the deeper pores become filled with the alloy in time, and the trouble will then cease. It will hasten matters greatly to grind the mortar with powdered emery, or other suitable abrasives, until the surfaces are smooth.

To amalgamate the alloy, begin with a circular motion with the pestle, using very light pressure so that the mercury will not be forced away from the alloy. As soon as the alloy has taken up the free mercury, heavier pressure should be used on the pestle and this should be continued until all the granules have been incorporated and the amalgam has a bright mirror-like appearance and has become thoroughly plastic. When this point is reached the amalgam should be removed to the palm and rolled and worked rapidly. When the mass becomes sloppy, the excess of mercury should be expressed and the kneading continued. Rapid rolling seems to bring out the excess mercury better than any other method; it also insures a better solution by rapidly changing the position of all the alloy granules. The excess mercury, necessary for thorough manipulation, should be removed as thoroughly as possible and the kneading continued until signs of setting are apparent. This will be indicated by the oncoming rigidity of the mass or the "cry" of the metals.

It is difficult to state the exact consistency at which amalgam should be placed in the cavity. The most desirable consistency is that obtained by expressing all the mercury possible or in excess of the amount necessary for perfect adaptation. Unless the operator clearly realizes how very difficult it is to thoroughly adapt amalgam, he should experiment on cavities in extracted teeth, under conditions as nearly normal as possible, and when the filling has thoroughly set, split the teeth and examine the adaptation carefully with a glass. Possibly a glass will not be necessary.

Amalgam resembles, physically, the structure of concrete. For greatest strength, concrete must have an undissolved integral unit the sand and crushed stone; there must be a definite amount of the cementing substance—the cement and water; these must be condensed under heavy pressure to bring the parts into closest union—hence the tamping machine.

With amalgam, the strength is obtained from the silver and copper in the alloy granules. These granules are partly dissolved and united by mercury, but mercury in itself is not as strong as Portland cement, therefore we must avoid all unnecessary excess of it and get our integral strength units as nearly together as possible. This is best accomplished by properly shaped condensing instruments and the hand mallet; the mallet force not only condenses the mass but, in addition, agitates and vibrates the undissolved granules so that further excess of mercury can be removed. Doctor Black found that the average amalgam filling contained about 14 per cent. of air space, and it is unnecessary to state that these air spaces are not desirable.

To further prove the superior strength of amalgam from which the excess mercury has been removed and which has been thoroughly condensed, we made the following experiment: Fifty fillings, 85-1000″ cube, were made in steel dies all from the same alloy. Twenty-five had the excess mercury wrung out through chamois and were malleted into the cavities under heavy pressure. Twenty-five were made by expressing the mercury between the thumb and fingers and condensing very thoroughly by ordinary hand pressure. At varying intervals we crushed the same number of fillings from each lot in the dynamometer and made a record of the crushing strength. The average strength of those which had been thoroughly condensed with the mallet after the excess mercury had been removed by chamois was 514 lbs.; of those with the usual amount of mercury remaining and condensed by hand pressure, 385 lbs.; that is 129 lbs. or 133½ per cent. in favor of heavy condensing and a minimum of mercury.

It must be borne in mind that these tests were made with very small fillings, 80-1000″ cube. With fillings of ordinary size, the strength would be increased proportionately. You may say, "The strength is already excessive and it is unnecessary to increase it." We must remember, again, that amalgam is not ductile and that the full force of occlusion is often exerted upon frail margins which are tested to their utmost to resist accidents. Not only this, but as the strength is increased, the tendency to flow is diminished. It is just as important that amalgam should resist flow as that it should resist fracture. Flow of amalgam is its tendency to move under pressure, either sustained or intermittent. The leaking margins which we frequently observe are oftener from flow than from shrinkage. Flow is only a change of form; it is not in any way an increase in the bulk of the filling; therefore, if the filling should move from the cavity in the least degree, a leak must be created at some point. Hence the necessity that the amalgam should have a large safety margin of strength to prevent flow.

Amalgam should always be kept dry during its manipulation; any moisture, water, chemical solution, or saliva which comes in contact with the alloy tends to decrease its strength about one-third.

There are on the market a variety of solutions for washing alloys to "make white alloys and aid amalgamation." They may possibly remove some of the oxide of silver, but this does not make a filling any whiter. Their principal harm lies in moistening the granules and preventing thorough amalgamation. All of the tests made with these solutions resulted in a decided loss in the strength of the amalgam.

So much for the possible strength of amalgam, but it is well to bear in mind, always, that amalgam with all the excess of mercury removed sets very rapidly and that it is very difficult to adapt it perfectly to the margins. *Very rarely* is it advisable to work amalgam as dry as it is possible to make it.

Before the amalgam is mixed, everything about the cavity should be in readiness. The rubber dam should be in position, wherever possible. Some means at least, should be provided to keep the cavity free from moisture until the amalgam is in place. It is not enough to prepare the cavity and then dry it, for it will be impossible, under these circumstances, to remove the dried salts and debris of the saliva from the cavity and its margins. No moisture should come in contact with the cavity after the final cutting is done. The matrix, when it is needed, should be in place and securely adapted. The instruments to be used for condensing should be tested in the cavity to make sure that they are the proper form to reach the different angles of the cavity. Not until these things have been observed should the amalgam be mixed.

In placing the amalgam, it is often best to start with a small piece that is not as dry as the balance of the mix; it will pack and adapt more perfectly than the very dry amalgam and the excess mercury can be removed as it makes its appearance while packing. Start condensing with instruments which will carry the amalgam into the angles and over the margins of the cavity. The matrix should not be too tight to allow a very small excess of amalgam to be carried over the margins. If the amalgam does not pass the margins at all, it is quite certain that it has not entirely covered them. Amalgam is treacherous to pack; it readily gives the appearance, on the surface, of being well condensed, and only careful examination will reveal the defects. It requires very heavy hand or mallet force to thoroughly seat and condense it. This force should be applied first in the angles of the cavity, then the condenser should be stepped so as to reach the margins last. After the floor is covered, larger pieces and larger condensing instruments may be used, as the size of the cavity will permit, and the force may be greatly increased as the size of condensers and the density of the amalgam increase. Heavy force will usually bring an excess of mercury to the surface; this should be removed and drier amalgam added. To fill the cavity, finally, a large excess of amalgam should be added and a condensing instrument, sufficiently large to cover all the margins should be used to drive the amalgam tight on all margins.

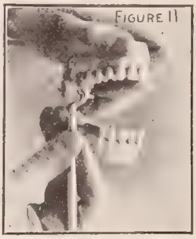


Fig. 11— Illustrating the use of the surface condenser in perfecting the adaptation of the amalgam at all margins of the cavity, and also driving all possible excess of mercury from this portion of the filling. An excess of mercury left in the amalgam at the margin would make a weak margin and subject to flow or fracture.

Amalgam is a semi-plastic material and it would be impossible to make a wide area of margins tight by passing with pressure from one point to another. Very naturally, pressure *down* at one point must produce pressure *up* at another point, so that a leak will result. To overcome this, we use condensers which will produce pressure over all surfaces simultaneously. The large excess of amalgam used has the advantage of removing any excess mercury from the cavity margins and gives strength at this point, where the greatest strength is desired; it also protects the margins from the blows of the condenser and makes it possible to get perfect adaptation.

IV. CONTOUR AND FINISH OF FILLING

After the amalgam has been placed, it should not be touched until it has crystallized sufficiently so that it can be carved. If the condensing has been thoroughly done, as described, this will usually take place in a very few minutes. The necessary carving should then be done, the excess of amalgam removed, the filling given the proper form, and the patient dismissed with an appointment for the final finishing.

Many complain that patients will not return for the final finishing. This is usually because they do not understand that it is essential. Tell them that the operation is not complete and that they must return.

The finishing and polishing of the amalgam filling is accomplished in the same manner as the finishing and polishing of a filling made from gold foil. The proximal surface from the point of contact to the gingival margin should be finished with files and strips. Disks and stones are very useful upon the other surfaces but a disk should never be allowed to pass over the contact point and flatten it. For finishing the grooves and sulci, one of the most useful instruments is the split mandrel in which pieces of strips are carried. As the mandrel revolves the strip is rolled up and is used for polishing in those positions on the occlusal surface to which its form is best adapted. The size of the roll can be varied by the length of strip used. For the final finish any of the common methods may be used, such as buff wheels, brush wheels, etc., carrying chalk or other fine abrasives. A very brilliant finish can be secured by the use of any of these materials.

V. PROFITABLE FEES

Most patients will return for the final polishing of the fillings if they understand that it is really important. It is only because of the education that these patients have had previously that they underestimate the value of good amalgam work; the dentist is largely to blame for this condition. Our patients will and do believe what we, as dentists, tell them; they have no other reliable source of information regarding the care of their teeth.

If we look still further back for a reason for the unsatisfactory status of amalgam work, we may find it in the fact that we dentists have been careless about operations of this kind. The fact is, we really have not greatly desired that our patients should return for a final finish of their fillings, and the reason for this is, very largely, that we have had a feeling that we were not getting paid for the time and labor necessary to make as good an amalgam filling as we were capable of making. Instead of increasing our fees so that we could well afford to use the best alloy and properly complete the best possible operation, we have been content to make our amalgam work of a low grade and to allow the patient to understand that it was only a substitute for the "real thing," which is always the line of work which brings the best remuneration. No dentist with such an attitude can be honest and if not honest, both to himself and his patient, he is not ethical.

Very true, there are exceptional places where amalgam will not give as good service as will gold foil, a gold inlay, or possibly some other material, but in the large majority of cavities in bicuspids and molars, it will give better service than the average inlay and better service than such a gold foil restoration as can be made by the operator of average ability.

However, for the average operator to give this high grade of service there must be a revolutionary change in his attitude toward the importance of the subject. It is not to be expected that a continuance of the careless methods of the past will produce anything but subsequent failure. It is not easy to express, in written words, ideas which will cause men to abandon habits which are fixed in their daily work and to strike out in paths which are new and, in some particulars, unknown to them. But in some way it must be done. The importance of the subject to the health and life of the people is so great that we must, in some way, bring about these changes though they seem revolutionary to many.

We know that any method which we may suggest for the aid of those who sincerely desire to make as good amalgam restorations as possible, will be ridiculed by some, considered unethical by many, and thought by others to be the idle dream of a biased and impractical crank. The suggestions which follow are offered, with the knowledge that they have heretofore been of value to many, for the benefit of those who may feel the need of such assistance in putting their amalgam work upon a higher plane.

There are two good reasons why better amalgam restorations are not made: *First*, ignorance of better methods; *second*, unsatisfactory fees. In the preceding pages we have attempted to demonstrate some improved methods in amalgam work; the question of satisfactory remuneration is a difficult one, and for some unknown reason it seems more difficult to adjust it properly for amalgam work than for any other operation. It *seems* more difficult, but really is not. Most of us have a fixed idea that it is next to impossible to get more than our standard fee for an amalgam filling, no matter how difficult the operation or how good the result. We are certain that our patients know exactly what they have been paying for every filling and that any increase would drive them away. We are very much mistaken. Few have any idea of what they are paying for a single operation, and, with *very* few exceptions, all want restorations which will prove as permanent as possible.

Talk to your patients, tell them what you have been doing and what you would like to do for them. One of the greatest helps in convincing patients of the advantages of any new kind of work is an attractive sample case of work similar to that which you wish to do for them.

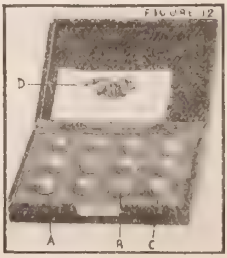


Fig. 12—Amalgam restorations in extracted teeth mounted in an attractive case convenient for explaining points to patients. D—A selection of teeth that have been lost because of ill-fitting gold crowns and fillings. A valuable lesson.

This will prove especially advantageous in cases where large amalgam restorations are needed. Point out the advantages of the operation that the contour of the enamel at the gingival margin does not need to be destroyed, as it surely would be if the tooth were crowned; that the adaptation of the margins is perfect and micro-organisms cannot enter the tooth; that there are no rough margins to irritate the soft tissues and set up irritation, which is so often followed by the most serious results; that the whole restoration is solid metal; that it cannot wear out; that it will not absorb foul liquids and gases as a mass of cement, such as a crown contains, will always do; that these restorations require just as much time and skill as are required for the making of a crown; that the material is the best of its kind that money can buy and the price is only such as is fair for the service.

The following is one of the methods which has proved most successful for those who wish to do a better class of amalgam work and realize that, to do so, they must increase their fees: *First*, procure the best alloy you think it is possible to buy, and keep it in an attractive looking bottle beside the old alloy. Tell your patients that you are changing your methods along certain lines; that in the past you have done the best that you could, under the circumstances, for them; that there is an improvement in alloys now, and name the advantages which appeal most to you. Tell them that the alloy costs two or three times as much as the old alloy, but that that is not of so much importance as the fact that it requires much more time to prepare the cavity and insert the filling; that an investment in special instruments is required; that the methods are very exact; another sitting is required to finish the filling, etc.; that you cannot be expected to make such fillings without a satisfactory fee, although you have no objection to doing the same kind of work which you have done in the past for those who desire it. There are very few who do not wish the best filling they can have if they understand its advantages. The trouble and pain which accompany dental operations is so great that no one wishes to have them repeated any oftener than is necessary. The talk should be nothing but the truth, conservatively stated.

Patients are willing to pay a fair fee for good dentistry; when they understand that they are getting value commensurate with the amount paid, there will be very little objection to reasonable fees. The men who experience the most difficulty in getting good fees are frequently those who have failed to prepare themselves to perform that class of operations which is deserving of better remuneration. The two must go together—better work with higher fees—otherwise dentistry becomes a confidence game which should be amenable to the laws of the state.

DISCUSSION

DR. OTTO U. KING: I feel like saying, "Let us all stand and sing the doxology and be dismissed," because it seems to me that the doctor has so thoroughly covered the subject there is nothing left to be said. There are, however, two or three things I want to discuss. As to cavity preparation, I do not exactly coincide with the essayist because I think he makes his angles too acute and cuts off some of the enamel rods that will eventually make a weak place at those points, and a giving-way of filling. Relative to his matrix, with the hole that he punches in this, it would seem to me that when he had made this restoration, and removed the matrix, he has produced a wart in place of a contact point. I mean that it is not a scientific contact point that he has given to the amalgam filling after he has made the restoration. One question I would like to ask relative to those large fillings, why not use a screw post to assist in retaining these fillings? As to the large cavities shown on the screen, I would not fill them with amalgam, but would put in gold inlays. It occurs to me that, taking into consideration the time and care it takes to reproduce an amalgam filling, a dentist could do a better piece of work, reproducing a more permanent restoration and far more esthetic appearance by using a gold inlay.

As to the seven reasons he gave for failure of fillings, as for No. 6, I would have called that careless finishing. I think a large amount of our failures in amalgam work is due to our finishing. I had an old gentleman come into the office the other day, a plasterer, and he said, "I would like to have my filling floated." I said, "What?" He said, "I want them floated," and I said, "Sit down here and we will float them."

After he sat down I noticed that someone had put in amalgam fillings which had developed large canyons between the enamel margin and the edge of the amalgam. This was due to faulty manipulation and faulty technic, and carelessness in cavity preparations. There is one thing about this amalgam investigation that makes me heartsick. I had the same feeling after I read Doctor Black's extended articles on this subject, and also after hearing Doctor McCauley, at Cleveland, at the National Association convention in 1911, and now Doctor Crandall today, viz.; they all talk about the necessity for balancing alloys and then close by assuring us that we cannot balance an alloy. I was in hopes Doctor Crandall would show us some way whereby we might know how to scientifically balance an alloy and use it in every-day practice. You purchase alloys on the market and you are not assured that you have one that is balanced. Doctor Crandall says it is impossible to prepare them. Two mixes may be different. We may buy silver in the open market today and then again tomorrow, and these two different silver bullions may not be the same and may not give the same results. I hope some one will be able to give us an amalgam that will balance. There is just one thing more I want to say on this subject and that is this, that it is easy for us to hear a fine paper such as this, with the immense amount of work the doctor has spent on it and we say to ourselves: "It is just the thing," and we promise ourselves while here that we will improve our work in amalgam. We go home and for two or three days do better work, and then we drift back to the same old methods. Someone has said that it takes six years to change a habit. If you have been putting in amalgam with wet cotton pellets, it will be difficult for you to do it with serrated pluggers, and will take some time to change such a habit. Very few of us do the work that is necessary to restore the normal occlusion in amalgam fillings. We just smooth them off, when we should restore the fillings with their natural grooves, duplicating nature, etc. I hope we will all go back to our offices and see if we cannot do better amalgam filling work.

Dr. C. A. Priest: I am not going to try to discuss anything as to the scientific mixing and preparing of those alloys before they are given to us. The thing we must deal with as dentists is our patients, and we must deal with them as we would like to be dealt by. Doctor King says he would put gold inlays into those large restorations. I think the time has come for the Almighty to pity any dentist who is going to use but one kind of filling alone, and not consider any other. I do not say this through disrespect, but I think the time has come for all dentists to be what we claim to be, and to treat our patients as we would like to be treated. If we would go to a physician and would find he was giving aromatic spirits of ammonia for every ailment under the sun, we would hunt up another physician. And so it is with our restorations. If we are going to use gold inlays for every restoration under the sun, it is time for us either to quit dentistry or to attend a few more dental meetings and learn what is to be learned in such papers as Doctor Crandall has given us. If you go away from this meeting without seeing the clinic Doctor Crandall is going to present to us, and seeing what can be done with amalgam, you are missing three-quarters of the meeting, because I think there is no other filling material that will restore as well as many teeth as amalgam, if used properly. In the case of cavity preparation, I think Doctor Crandall brought it out very well. He says not to put cement under the amalgam, and I say further not to put gutta percha under the amalgam, which he forgot, and which we oftentimes find. If a contractor was to build a house for you, and you would tell him you wanted it on a solid foundation, and he would dig down to a solid foundation and would then fill the trench partly full of sawdust, you wouldn't consider you had a solid foundation; and the same is true with gutta percha and cement underneath your amalgam filling. After you have your foundation well prepared, then the placing of your amalgam is the next step, and a very important one. We all have ways of condensing our amalgam, the same as with gold. If you use hand pressure, all right. If you use a burnisher you can do it well. But in either case, you should give at least fifteen pounds' pressure to condense the amalgam thoroughly. However, I believe you can condense amalgam better by malleting than by hand pressure. But I think it would be well to burnish well instead of malleting the first piece. I do not mallet the first piece of amalgam; I burnish it in, but always cement the joint. I do put a thin cement lining under all fillings, regardless of whether it is gold or silver (merely to seal the joint). I think we can control the flow a little by having a thin layer of cement, and it helps to seal the joint.

An amalgam filling is never well placed until it is finished. By finished I mean to have it flush and well polished. One man I heard say, "Amalgam is an eyesore; but it is not when it is built as Doctor Crandall builds fillings." When you see the kind of restorations he makes you will all agree with me, and I think if we will all take home with us what he has told us, we will all be better dentists. When finishing, carve up the cusps as nature would carve them. Nature has so prepared us with cusps on our teeth, and those cusps are not smooth, but rough; but you will notice there is a system to that roughing, made for the grinding of food. We are not putting in those amalgams just to restore that tooth alone; it is for a purpose, and the filling is not well placed until we produce a filling and a tooth that will give us the service that the natural tooth would give, and to do that we must give it the articulation and cusp that will grind. I think I couldn't add anything to Doctor Crandall's paper more than what he will give you in his clinic tomorrow.

Doctor Crandall (closing): Doctor King has raised some questions, and I think he has misunderstood me. He spoke about my making such a long cavo-surface angle. As a matter of fact, the artist with this picture has intensified my angle. I would have as nearly a right angle at the cavo-surface angle as possible, and still have those short rods removed. The short rods should be removed before the angle gets so deep, so that it leaves very nearly a right angle at that margin.

About that wart for the contact point, there was about three millimeters between that band and the next tooth. That will have a convex form in the band, and the form is made with the band right against the teeth, and the contact is good.

He asked me why I didn't use a post, and I ask him why he does. The strength is always more in a restoration of that kind than we have need for If you put in a post, it would be sticking up there, and you make it difficult to use your instruments in condensing your amalgam, and it would leave a weak point up through the structure. I have made these large restorations for about twelve years, and I have seen some of them about that age, and I have yet to see one that has broken down. I have made mistakes. It has been a matter of evolution, the making of these large restorations. I have made some with posts, but think without them I can get so much better condensation and the strength is ample. I first used amalgam, and then built a crown around it, and then the thought came to me that the amalgam supported the crown, and why not make it all of amalgam?

Doctor King: Do you use the gold inlay at all?

Doctor Crandall: Yes; but can you make inlay restorations of that sort, and cast them,and place them back and get the margins we can get this way? That is very difficult.

I failed to mention the finishing of the amalgam. It is hard to illustrate this with lantern slides, or describe it in a talk. I finish it the same as a gold restoration. I have an excess of amalgam, and I carve it down. The first thing I do is to carve the occlusal surface, and after that I take a little brush point and pumice stone, and finish it as well as I can. You cannot finish amalgam fillings at the first sitting, but if you use the pumice stone at the first sitting, you will find it easier to finish at a later sitting. Then I do the rest the same as with gold. I am as particular with amalgam as with anything else, and it takes time to finish them and finish them properly.

A Member: It takes a good while, doctor, and what about the fee?

Doctor Crandall: If it takes as much time as for other work of that type, I get the same fee.

Now, as to the matter of balance, we do not want an exact balance in amalgam. There is a point between there that is desirable, and you can buy plenty of alloys between those two points, and a number of manufacturers will supply them. My experience teaches me that an expansion of from six to twenty or twenty-five microns is desirable. It is impossible to get shrinkage under any reasonable use, and you will not get expansion that will be discernible.

Doctor Priest mentioned the cement lining under cavities, and that always stirs me up; I do not like it and he does.

Doctor Priest: Suppose you have a vitalized tooth, and the roots are filled with gutta percha, would you use a cement lining between the amalgam and the gutta percha?

Doctor Crandall: It is all right to place cement which will just prevent the amalgam from getting down onto the gutta percha. I would certainly have the gutta percha covered with something.

A Member: You say this amalgam shrinks towards a given point, a center from all directions. Why is it that in dressing down a tooth and cutting from the top, you will find a line between the filling and the tooth? You cut that down and you come to an absolutely tight joint.

Doctor Crandall: I think that line refers to an amalgam filling placed in a tooth and never finished, never polished down to a perfect margin. Where you polish down to the exact margin, you get a perfect margin.

A Member: I do not refer to that. It is where it has been properly placed and you find a line in there.

Doctor Crandall: It is probable there has been a flow in a certain direction, and it has left that margin.

A Member: Will it flow from the margin toward the center?

Doctor Crandall: No, from the cavity out, away from the cavity. If it were flowing toward the proximal surface, it might flow toward the center and beyond the center.

A Member: What percentage of these fillings that you have placed in, after five years, we will say, are you not able to get an instrument, and find the margin of your cavity?

Doctor Crandall: When properly finished, as I described, a very large percentage would have a perfect margin.

A Member: I have been buying my alloy in quantities, and I suppose most men do. You state alloy should not be used after one year old. Is there any way to reanneal that?

Doctor Crandall: No; the only way to buy alloys is to make the manufacturers put the date on them.

A Member: Not many of them do it.

Doctor Crandall: Two or three of them do.

A Member: Why not give us their names?

Doctor Myers: An amalgam is manufactured under Doctor Crandall's formula, and they put the date on it.

A Member: What is a sure way of getting clean mercury?

Doctor Crandall: From my experience, the best mercury is the Merks and the Cle-dent is about the same. I have never used the Consolidated mercury. I understand that is pûre. I would not go to a druggist and buy mercury, except that you might buy some of the standard mercuries. Alcohol placed in the container will prevent oxidation and keep out impurities.

A Member: Some of the worst I ever had was Merks, bought at a drug store.

A Member: Does it make any difference with the alloys whether they are kept corked up tightly or not?

Doctor Crandall: The only difference is you might get dust in it. It makes no difference as to the air. If you keep it in an ice box at 27 degrees, it will not anneal.

A Member: How do you expel the mercury from the amalgam?

Doctor Crandall: As I have the material mixed, I take it first quite plastic, and place it in the cavity and condense it down to the margin. The assistant takes the larger part of the mix in an aseptic napkin and with pliers presses it out. Then we put on the amalgam, and condense it, and continue that.

A Member: Years ago when we drew the mercury to the top, particularly with the last layer of tinfoil or goldfoil, and we got a rather dry surface that way.

Doctor Crandall: It can be gotten that way. I failed to mention the uses of a large mass of amalgam. I pack in a large excess. I build the restoration up much higher than I want it to remain and get a thorough condensation. With heavy, hard pressure and mallet force the undissolved alloy granules are driven close together down in the mass, the mercury continuing to come to the surface so that it can be removed. This process is continued until thoroughly condensed amalgam will be where the margin should come. I condense my amalgam so I can start in to carve right away, and these granules are driven so closely together and are cemented with a thin layer of mercury so the mass will stand up. With the tin or goldfoil absorbing the mercury, that is a rather dangerous thing, because the excess tin and gold are liable to be absorbed at the margins, and will produce shrinkage where you might not want it. I finish with these great big instruments, and they drive the mass down so that it is tight at every point along the margin.

THE PRESIDENT: At Doctor Crandall's suggestion, I would like to call upon Doctor Dinwiddie to tell us of his experience with this method of alloy.

DOCTOR DINWIDDIE: I am a novice at it, and I started in at it second-hand. I got started through a friend of mine who was with Doctor Crandall a couple of days. He showed me how it was done, and I bought the instruments and Crandall's alloy immediately. The technic I am using is very similar to Doctor Crandall's, and I wouldn't use any other. The carving and the contour that you can get is wonderful, and I wouldn't go back to the old method of putting in alloy for anything. What Doctor Crandall tells you I am sure is right, and I think when you see his clinic you will be convinced.

DOCTOR KING: In order that I may square myself for the statement about the wart, I move that we give a rising vote of thanks to Doctor Crandall for his scientific and practical paper read to us this afternoon.

RELATION OF DIET TO DENTAL CARIES AND MOUTH INFECTION*

BY J. H. KELLOGG, M.D., LL.D., F.A.C.S., BATTLE CREEK, MICH.

I APPRECIATE GREATLY your courtesy in inviting me to present before you my views on the relation of diet to dental caries, especially as I enjoyed a similar honor some eighteen years ago.

I cannot hope in the time allotted to me to discuss my subject in all its bearings, but I shall endeavor to establish the following points.

1. That dental decay and mouth infection are the results of lowered vital resistance rather than neglect of the use of the tooth brush.

2. That the large prevalence of dental decay among civilized people is one of the stigmata of race degeneracy.

3. As regards the relation of diet to dental caries, I shall undertake to show:

a. A low protein diet combats intestinal toxemia and thus raises the general vital resistance. A high protein diet promotes the growth of putrefactive and pathogenic bacteria in the lower intestine to an enormous extent and floods the body with toxins produced by other pernicious organisms, exhausting and finally permanently crippling the poison-destroying and eliminating functions.

b. The wide prevalence of lime starvation as a result of disregard of the lime content of foodstuffs and the general use as food staples substances wholly or nearly wholly deficient in lime.

c. The necessity for the use of dry food to stimulate the normal flow of saliva.

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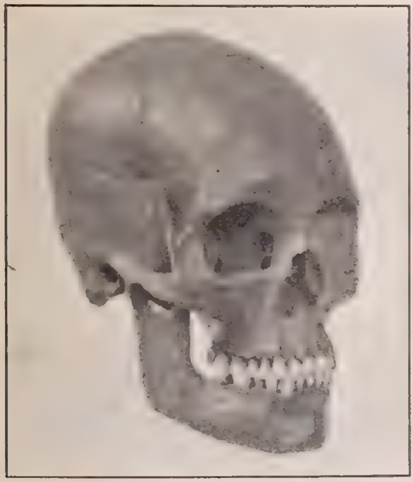
*Read before the Michigan State Dental Association at Grand Rapids, April 1915

d. The importance of foods containing an abundance of cellulose to secure proper scouring of the teeth and to furnish bulk to promote intestinal activity to the extent of three bowel movements daily.

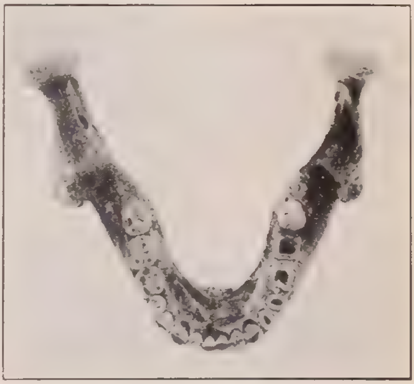
e. The importance of the regular and free use of uncooked foods.

Our modern civilization, with its infinitely precious gifts to the human race, has not proved itself to be a permanent attainment. To make its triumphs complete and to establish them on a lasting foundation, civilization must do for the man physically what it has done for him intellectually and ethically. As Herbert Spencer pointed out a generation ago, man, to attain the highest levels morally and intellectually, must first of all become a good animal.

Our modern civilization, has overlooked this basic fact, and so while every one of the creatures man has gathered from the forest and trained for his service has been marvelously improved and actually transformed into new and larger and vastly more efficient species of animals, the animal, man, has not improved, but has actually degenerated. Decay of the teeth is one of the stigmata of this degeneration which has smitten the race and threatens it with extinction.



Malakos Indian Skull



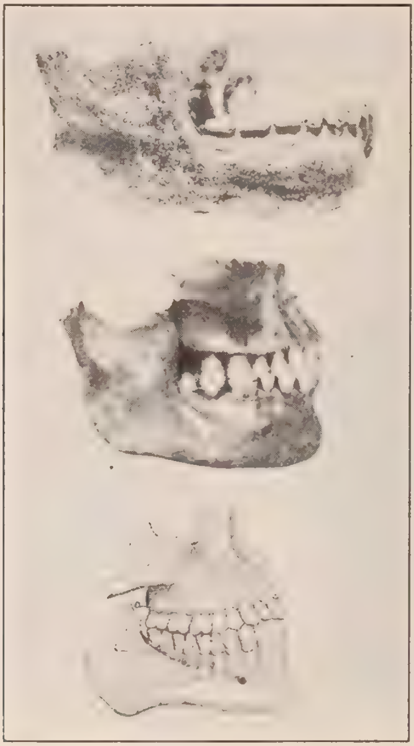
Heidelberg Jaw

In general the causes of this degeneracy are to be found in the fact that in establishing the sanctions and modes of civilized life, we have neglected to provide compensations for the losses involved in the change from a wild, forest environment, to the treeless, sunless, smoky, dusty, germ-infested, death-inviting city.

Naturally an out-of-door animal, man has become a house-factory-office dweller and has acquired that house-stable disease, the worst plague of civilization, tuberculosis, as the natural result of his lowered vital resistance and acquired susceptibility to bacterial infection.

Biologically a primate, closely related to those other remarkable primates, the orang, the chimpanzee and the gorilla, civilized man has abandoned the diet of his class and has formulated for himself a bill of fare wholly unlike that of his remote forbears and his surviving forest relatives, the anthropoids.

Primitive man, as the great French naturalist, Cuvier, pointed out more than a century ago, and as ancient historians from Moses to Herodotus and Plutarch inform us, selected his bill of fare from the natural products of the earth, which he took pure and whole from the hand of Nature, unsophisticated by the disease-breeding processes of the culinary art, "cooked in the sun," as the native Mexican says. With this simple natural fare, the teeth had every opportunity for perfect development. Tooth lotions and antiseptic dentifrices were not needed, for many times daily the teeth and mouth were disinfected by the germ-destroying and inhibiting acids of juicy fruits. At feeding times, the chewing muscles were brought into vigorous action and the teeth made to strike their roots deeper into their bony sockets by the exercise of cracking nuts, while their crowns were thoroughly brushed, scoured and polished by the chewing of fibrous roots and other esculents. The splendid dentures of the gorilla, which still sticks to the original primate bill of fare, afford good



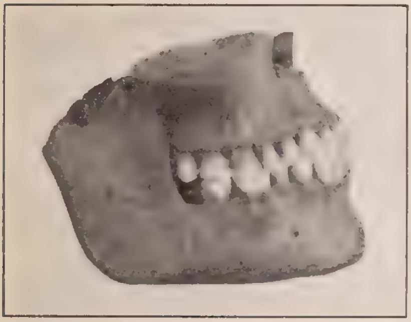
Heidelberg Jaw

Malakos Indian

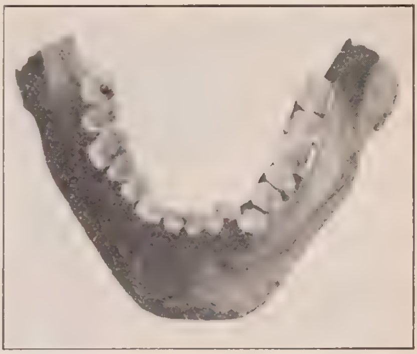
Modern

evidence of the efficiency of a natural diet as a means of tooth conservation.

The Heidelberg jaw, after lying buried in the earth for two thousand centuries, presents the same characteristics of development and durability as do those of the modern man-like ape, which still enjoys the advantages of a primitive environment and a natural diet.



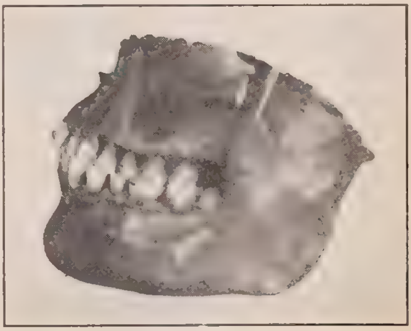
Malakos Indian



Malakos Indian

The teeth of modern man are almost altogether deprived of these natural protective influences. Fruits are eaten as a luxury rather than as a substantial part of the diet, and many people eat no fruit at all. By milling and cooking processes the cellulose and other resisting structures of the food are so broken up that the grinding function of the teeth becomes superfluous and the mouth becomes simply a port of entry for foodstuffs and palate-ticklers, its use as a digestive laboratory being almost wholly suspended.

Malakos Indian



Malakos Indian

A further menace to the teeth results from the addition of animal flesh to the bill of fare, substances with which the teeth are not prepared to deal, and which are not only the source of direct infection of the mouth, but promote the development of various species of destructive organisms by providing in abundance highly favorable nutrient media.

But the fundamental cause of dental decay lies deeper still. Wiedersheim, the world's most eminent comparative anatomist, points out the fact that besides the tendency to premature decay, the human teeth are degenerating both in size and in number. The human race is becoming edentulous. Wiedersheim also calls attention to the fact that the lower jaw and the muscles which move it are becoming smaller.

Every dental surgeon is familiar with the fact that certain of the teeth are frequently found wanting or deficient. The outer incisors of the upper jaw are often lacking or are reduced to mere stumps, and the third molar is evidently disappearing, probably because the shortening of the horizontal ramus of the inferior maxillary through lack of use leaves no room for it. Wiedersheim rightly attributes this marked tendency to degeneracy of the mechanism of mastication in man to his change in diet. There is definite evidence that this degeneration of the teeth has been very rapid in comparatively recent times, doubtless the result of the very radical change in eating habits which has occurred within the last century.

I have in my possession the skull of a mound-builder, a Molakas Indian, taken from a mound on Roberts' Island in San Francisco Bay, evidently that of an old man, yet each jaw contains sixteen well-worn teeth, not one of which shows the slightest evidence of decay.

The commission appointed by the British Parliament some years ago to investigate the causes of physical deterioration in the British Islands report that a study of skulls, which were obtained from the plague pits, where they had lain for two hundred years, since the great plague of London, showed much better teeth than those found in modern skulls.

In the writer's opinion, dental caries and other forms of mouth infection are primarily due to causes which are undermining the physical stamina of the race and producing physical deterioration not only of the teeth but of the entire organism.

Some of the facts and the causes of race degeneracy, the writer has undertaken to point out in other papers, and hence this phase of the subject will be passed by with this mere reference, as it is the special purpose of this paper to point out in particular the dietetic practices which are specially active in producing dental decay and mouth infection.

In a general way, all matters of diet which tend to deteriorate the body by lowering the vital resistance may encourage dental decay. This is especially true of influences which impair digestion, as any such injury shows itself immediately in general impairment of nutrition.

In a paper read before the Michigan State Dental Association at its annual meeting in 1897, the writer reported the results of a special study of the teeth in one hundred cases, with special relation to the condition of the digestive organs. This study seemed to show conclusively a very close relation between certain gastric conditions and the condition of the teeth. Some of the facts noted may be of interest. Of the one hundred cases only two had perfectly sound teeth, and of persons suffering from a deficiency of gastric acid, about half the total number of cases studied, the average number of sound teeth was ten, whereas in the less advanced cases of digestive disorder, cases of simple dyspepsia, the average number of sound teeth found was twenty. Of the persons suffering from simple dyspepsia none had been compelled to resort to the use of artificial teeth, whereas among the 51 persons suffering from a deficiency of gastric acid, twelve were dependent upon artificial teeth; five having upper sets only, and seven having both upper and lower sets. Among the persons suffering from infection of the stomach or gastric catarrh, the number of sound teeth was one-half as great as in cases of persons not infected.

A study of the special characteristics of the germs found in these cases showed both acid-forming and gelatine-liquefying germs to be present in all but two cases; and in those two cases, acid-forming germs did not grow in the culture media, but the gelatine-liquefying germs were present, and the stomach fluid had an exceedingly offensive odor in both. All the teeth had been lost in both these cases.

These facts seem to show that an important relationship exists between an infected condition of the stomach and dental caries. The number of sound teeth found present increases with the amount of free hydrochloric acid present in the gastric juice.

At the time that paper was written it was generally believed and even taught by bacteriologists that bacteria were a necessary aid to digestion, but a series of careful experiments conducted at my request by Professor Novy of the University of Michigan in the laboratory of the Battle Creek Sanitarium and continued by myself and my assistants during several years, demonstrated that in the majority of healthy persons the stomach contents are found perfectly sterile at the end of the first hour of digestion after the administration of a sterile test-meal of cooked cereals and water.

When in a state of high resistance, the body is able to defend itself against the attacks of all the various organisms with which we ordinarily come in contact, as it is well known that bacteria capable of producing suppuration and fatal septicemia constantly swarm upon the skin and mucous membrane in countless numbers.

Swartzburger has shown that hundreds of billions of bacteria are daily produced in the intestines, chiefly in the colon. Notwithstanding the presence of these pernicious organisms, the skin and the mucous membrane remain intact, and the body in general is protected. The skin and the mucous membrane not only hold invading organisms at bay, but act as filters to exclude, in a large part, at least, the poisons produced by bacteria, while the liver, the thyroid gland, the suprarenal capsules, the spleen and probably other structures, destroy and detoxicate the poisonous products of bacterial action, and thus maintain an efficient inner line of defense. So long as this protection is complete a high state of resistance is maintained. The teeth as well as other structures remain intact until general vital resistance is lowered. Dental decay appears as one of the early manifestations of general bodily deterioration.

That simple neglect to cleanse the teeth cannot be the principal cause of dental decay, I think is clearly shown by the splendid dentures of wild animals and wild men, and by the further fact that dental caries is increasing at a rapid rate in spite of the vigorous use of the tooth-brush and the assiduous attention of thousands of dentists, whose numerous associations, well-equipped offices, fine automobiles and magnificent dwellings are abundant evidence of the prosperous state of their profession.

Mr. Arbuthnot Lane considers that oral sepsis is a result and not a cause of chronic intestinal stasis. He holds that it arises from the lowering of the resisting power of the tissues induced by the condition of the intestine. The writer is disposed to agree with Mr. Lane and his followers in the view that infection of the mouth is usually the result of lowered body resistance often due to intestinal toxemia, but it is also true that an infected mouth must lead to exaggeration of toxic conditions already existing lower down in the alimentary canal, thus establishing a vicious circle.

Every dentist must have noticed the constant association of constipation, coated tongue, bad breath, dingy complexion, and other phases of intestinal toxemia with rapidly advancing dental decay and pyorrhea. Among the various causes which tend to promote intestinal toxemia the most important are incomplete and infrequent evacuation of the colon and an excess of protein in the diet.

Intestinal stasis is in the writer's opinion one of the greatest, perhaps the greatest, of all the physical evils which afflict civilized man. The colon is a veritable Pandora's Box, out of which come every sort of functional derangement, structural degeneration, and mental and even moral ills galore.

The attempt made by the Germans to laugh out of court Bouchard's great discoveries relating to autointoxication did not succeed, and the dominant place of intestinal toxemia as a factor in the production of chronic disease and structural decay, is now conceded by a great majority of the pathologists, and is given great consideration in the daily practice of our most eminent clinicians.

The physiologic rhythm of the alimentary canal requires three or four evacuations daily; the bowels ought to move after every meal at least every intake ought to be soon followed by an output. Through neglect to preserve the functional activity of the colon by attending promptly to its demands and supplping normal conditions through proper diet, constipation has come to be an almost universal condition. Persons whose bowels move but once a day absorb an enormous amount of toxic materials resulting from proteolytic changes in the colon, besides the endotoxins which are set free through the death of hundreds of millions of bacteria in the intestine daily, virulent and mischief-making poisons which ought to be gotten rid of through the normal channel instead of being absorbed to be discharged through the lungs and kidneys after having bathed and damaged every cell and fiber of the body.

Many persons whose bowels move once a day, on careful examination, by the aid of the X-ray after a bismuth meal, may be shown to be suffering from stasis to a very high degree, retaining a portion of the unused ingesta for three or four days or even longer. The prevalence and intensity of intestinal stasis have been increased in modern times by the use of laxative mineral waters and a great variety of aperient drugs, every one guaranteed to be harmless, but all, in fact, capable of doing enormous harm by congesting and irritating the intestinal mucous membrane, damaging its filtering power and giving rise to colitis, as a result of which the way is opened for the absorption not only of bacterial toxins but of heterogeneous proteins which give rise to asthma, headaches, and various other anaphylactic phenomena, besides lowering the vital resistance and thus promoting dental decay and mouth infection.

In the writer's opinion, it is just as important for the conservation of the teeth to keep the colon clean and free from masses of stagnating and putrefying food remnants as to brush and cleanse the teeth. The colon is a most efficient incubator, and when the dominant flora is proteolytic in character, stasis will necessarily give rise to the production of such enormous quantities of putrefactive products that the poison-destroying ability of the liver, kidneys, thyroid, suprarenal capsules and other structures is overtaxed and the tissues are flooded with such quantities of toxic material that the alexins and the enzymes of the blood which normally afford ample protection through inhibiting the growth of bacteria become inoperative. The salivary and mucous secretions of the mouth become deteriorated, deficient in germ-destroying and inhibiting elements, so the fluids with which the teeth are bathed do not protect them but rather furnish favorable nutrient media for the development of destructive organisms which are thus permitted to form in colonies on the gums or the teeth and carry on other destructive work. It is quite as important that the patient should be taught how to make his bowels move efficiently three or four times a day as to instruct him in the use of the tooth brush and other mouth-cleansing measures.

One of the worst consequences of constipation is the breaking down of the natural barrier between the mid-gut, or the small intestine, and the end-gut, the colon. Nature has established at this point, the ileocolic junction, a double protection in the form of a sphincter muscle reinforced by a mechanical valve consisting of two folds of membrane which overlap, and readily open for the passing of material from the small intestine into the colon, but close tightly when there is the slightest back-pressure from the colon, thus preventing the reflux of feces from the colon into the small intestine. The ileocecal valve and its function were discovered and understood three hundred years ago, but it is only in recent years, since the

X-ray has provided a means for accurate study of the mechanical function of the intestine, that the real significance of the ileocecal sphincter and valve has come to be fully recognized.

The function of the stomach in the economy of the body is analogous to that of the kitchen in the domestic household. The stomach receives the food, disinfects it and prepares it to be acted upon during its passage along the alimentary canal. The small intestine, into which the food is passed from the stomach by the pylorus is the great digestive organ of the body. Here all the elements of the food are digested and absorbed. Five or six quarts of liquid material consisting of the ingesta and digestive fluids are daily absorbed from the mucous membrane. The unusable residue is finally pushed through the ileocecal valve into the colon, the function of which seems to be nothing more than the absorption of a few ounces of water and the disposal of unusable and excretory matters by discharge from the body through periodical evacuations. When undue accumulation of fecal matters occurs in the colon, the abnormal distension produced, together with the stretching resulting from gas formation, give rise to such a degree of dilation of the cecum and the colon as to render the ileocecal valve incompetent, thus permitting the fecal matters to pass freely back into the small intestine, which is thus converted into an extension of the colon.

The results of infection of the small intestine and the active absorption of bacterial poisons, give rise to the long train of evils which have been so graphically described by Combe, Lane, Metchnikoff and others who have made laboratory and clinical studies of the effects of intestinal stasis. Stasis in the colon produces most disastrous effects, but the ileal stasis which results from incompetency of the ileocecal valve, is almost infinitely worse in its consequences.

That this condition is very common was first demonstrated by Dr. J. T. Case, Rœntgenologist of the Sanitarium, who by a special technic has shown that incompetency of the ileocecal valve exists in about one out of every six persons who submit to X-ray examination of the alimentary canal after a bismuth meal.

It has been clearly established that most pronounced intestinal toxemia with a high degree of indicanuria coexists with incompetency of the ileocecal valve.

I have not yet had time to complete a statistical study of the relation between mouth disease and incompetency of the ileocecal valve, but in the course of a few months I believe I may be in possession of some interesting facts upon this point.

All the evils which have been portrayed as resulting from intestinal stasis are naturally aggravated and intensified to a high degree by an excessive protein intake for the growth of proteolytic and pathogenic organisms. The more abundant the protein in the diet, the more active are the putrefactive processes in the intestine and the quantity of putrefactive products absorbed, hence the more intense the intestinal toxemia resulting therefrom.

The difference in the flora resulting from a high protein diet and that found in connection with a low protein diet is well illustrated by the difference in character shown by the feces of a meat-fed cat or dog and those of a horse or cow or any other vegetable feeder. Bouchard noticed the same difference in a comparative study of the stools of two individuals, one of whom was fed on an ordinary mixed diet of meat and vegetables while the other received no meat or eggs. An extract was prepared from the stools of each and this was injected into rabbits with the result that the stools of the flesh-eating man were found to be twice as toxic as those of the flesh-abstainer. Herter showed also that a watery extract made from the stools of a man who ate meat quickly killed guinea pigs and other small animals when injected intra-abdominally, whereas solutions prepared from the stools of persons whose diet did not include flesh foods did not produce death.

In a letter received by the writer from Tissier of the Pasteur Institute a year or two ago the statement was made by this well-known bacteriologist that he had demonstrated by carefully conducted experiments that animal proteins are twice as prone to putrefactions as vegetable proteins. Hence the character of the protein as well as the quantity is a matter of consequence.

The amount of protein required for the proper maintenance of the body has been the subject of much discussion. Lankester, the eminent English physiologist, showed more than thirty years ago that the native Hindu was able to sustain himself in fine physical condition on a diet which contained less than half the amount of protein usually consumed by the average Englishman.

Ten or twelve years ago Chittenden of Yale showed that a ration in which protein constituted ten per cent. of the energy value was not only capable of maintaining the body in a state of health, but was in the highest degree conducive to endurance and general well being.

Folin of Harvard, in an experiment made a few years ago, demonstrated that the amount of protein actually required for the maintenance of strength and vigor is really very small. For two weeks he excluded protein entirely from his dietary without suffering any depreciation of weight or strength, although he did not interrupt his usual occupations.

Hindhede of Copenhagen has shown by experiments extending over several years that the proportion of protein contained in the potato is sufficient to supply all the needs of the body.

It has been clearly shown that the only function of protein in human nutrition is for repair of the nitrogen-containing tissues, chiefly the glands and the muscles. Fats and carbohydrates furnish fuel for the maintenance of heat and muscular work, while protein furnishes the material necessary for keeping the machine in repair. In other words, carbohydrates and fats are to the body what coal is to the locomotive, while protein corresponds to the metal supplies needed to keep the locomotive in good repair.

(*To be continued*)

SOME CONCLUSIONS REGARDING THE IMPORTANCE OF THE PRINCIPLES AND REQUIREMENTS OF BRIDGE WORK*

BY ALDEN BUSH, D.D.S., COLUMBUS, OHIO

IN REVIEWING THE RAPID DEVELOPMENT made in bridge work during the last century, and especially the progress of the last decade, two features regarding the history of its practice seem to be self-evident; first, its evolution has been phenomenal and second, the various methods and numerous modifications of procedure have been evolved and presented with such bewildering rapidity that the average practitioner, in the effort to enhance the character and degree of his service, has become confused in trying to master the multiplicity of methods presented and the innumerable variations of procedure advocated.

Bridge work, perhaps, received its greatest impetus through early enthusiasm manifested by the profession in the invention of methods which accompanied the discovery of the great possibilities in this field.

And while the early progress in the art of bridge work must be accredited very largely to this fact, nevertheless the development of the scientific phases of bridge work was made through the application of principles and not by virtue of methods.

The empiricism which permeated its early practice should no longer confound one who has in any degree acquainted himself with the principles which govern their application; neither should the chaos which surrounded the traditions of its early development confuse one who has familiarized himself with the requirements which govern their adaptation and construction.

The invention of methods and the evolution of procedure are closely interwoven in the development of bridge work and probably offer the most visible evidence of material progress, yet the science of the art is founded in a few principles and requirements and not on a multiplicity of methods and procedures.

Indeed, bridge work had no place and could not be considered as having a place among the scientific arts until the principles and requirements governing their indications and contra-indications, adaptation and construction were recognized and formulated, and much credit is due to Dr. Hart J. Goslee for his great labor and systematic effort toward the correlation and unification of the principles and requirements which have but recently placed bridge work on a teachable and scientific basis for the first time in its history.

Genuine progress in the art of bridge work will not be made until a more complete conprehension and mastery of the sciences in which the principles are engendered, are realized, and not until a more intelligent understanding of the requirements, which most intimately concern its scientific application, is more generally recognized.

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*Read before the West Virginia State Dental Society, 1914.

Too much repetition, therefore, cannot be used in teaching the importance of the requirements, neither can too much emphasis be laid upon correct principles of practice, for it is only through lack of observance of both that failures are so abundantly recorded.

In the entire field of dentistry no phase of its practice has been singled out for condemnation so much perhaps as has bridge work, and fixed bridge work especially; indeed, this is so true that the very mention of septic dentistry summons to our minds pictures of bridges by the score, that are so totally out of harmony with the governing principles and requirements that no power on earth could repair the damages which have been wrought by their tolerance. Let us hope that bridge work is generally made with the thought of rendering a service to our patients through increasing the efficiency of the dental apparatus to better perform its function of mastication; but furthermore, let it be remembered that, while this particular service may be partially rendered through consideration that more intimately concerns the mechanical and anatomical requirements alone, the physiological and hygienic requirements must also be observed, lest this increasing of the functional efficiency of the dental apparatus be more than offset by establishing conditions which may prove far more serious to the health of our patients than would be caused by the impairment of the dental apparatus through the physical loss of the few teeth we are striving to replace.

Teeth and the Digestion

From the time food enters the mouth and is masticated until its waste has left the body, the function of digestion goes forward through its various stages.

Mastication, accomplished in the mouth, is no doubt the most important stage of this function.

Defective teeth are a threat to health by reason of impairment of mastication, and consequently of digestion.

While the vigorous stomach may attack particles of food of considerable size and resistance, the process of digestion is naturally slowed up in proportion to the magnitude and firmness of the unground particles.

In addition to this, the admixture of healthy saliva to the food during the process of mastication is of no little consequence, especially in the digestion of starch.

Thus defective teeth not only injure by reason of imperfect mastication, but likewise by reason of a failure to properly incorporate the saliva with the finely divided particles of the food while it is still in the mouth.

It's an old saying, but a wise one, that "people dig their graves with their teeth." Take care of your teeth and save your health and lengthen your life.

ACUTE PARENCHYMATOUS GLOSSITIS*

BY VIRGIL LOEB, A.B., M.D., D.D.S., ST. LOUIS

THE BASIS OF THIS PAPER is a case of acute parenchymatous glossitis which I reported superficially in a paper entitled, "Unusual Cases in Oral Surgery," read before the St. Louis Dental Society during May, 1911.

In connection with the detailed report of the case which I now propose to give, I desire to enter into a brief discussion of the disease and the literature relating to it. Butlin, in his book on "Diseases of the Tongue," says:

> Acute inflammation of the tongue is admitted by all observers to be a rare disease. Even the largest hospitals in this country (England) do not, in most years, record a single instance. Yet the history of the disease may be written with tolerable accuracy, for the very rarity of acute glossitis has led to the publication of a goodly number of cases in medical literature.

From the reports of cases which I have been able to review, acute parenchymatous glossitis has been spoken of as acute glossitis, idiopathic glossitis, phlegmonous glossitis, deep glossitis and interstitial glossitis.

Baldwin[1] describes a case which he had observed, under the title, "Interstitial Glossitis," and Wagner[2] reports a case using the term "Idiopathic Glossitis." Sænz[3] and Duperier[4] each speak of the disease as *Glossite profonde* rather than as *Glossite parenchymateuse.*

The disease is noticed most often during the winter months and attacks males more frequently than females. It occurs chiefly between the ages of 20 and 40, though Bennett[5], in reporting a study of the literature from 1816 to 1906, states that cases have been reported at 9 months and 80 years of age.

Among the etiologic factors relating to acute parenchymatous glossitis, exposure to cold and dampness together with a lowered general resistance seem to be the most potent. Infectious diseases also play an important role. Weis[6] described a case which followed the desquamation of scarlet fever. Sabrazes, Bonnes and Parsat[7] report a case in a man whose children had had scarlatina just previous to his illness and they thought the patient may have had a scarlatinal throat. No specific germ has been isolated, though streptococci and staphylococci have been found.

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*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative journal for the dental profession, by special arrangement with the Jour. A. M. A.

[1] Baldwin: Cincinnati Med. Jour., 1896, ii, 143.
[2] Wagner: Med. Rec. New York, 1893, xliv, 523.
[3] Sænz: Contribution a l'etude de la plossiti profonde aigue, Montpellier, 1906.
[4] Duperier: These de Paris, 1906-07.
[5] Bennett: Washington Med. Ann., 1906-07, v, 267.
[6] Weis: Loire med., 1908, xxvii, 366.
[7] Sabrazes, Bonnes and Parsat: Presse med., 1906, xiv 303.

Predisposing causes are injuries to the tongue from carious teeth, faulty dental work, tooth-picks, splinters of wood and other foreign bodies. Gerhard[8] adds as further causes the action of corrosive substances, hot liquids and the stings of insects.

Sore throat often precedes an attack as in cases described by Washburn[9] and Green.[10]

The disease is usually ushered in by pain which is located in the tongue but often in no specific area. This pain comes on suddenly and increases gradually in severity. Accompanying it, though not always immediately, there develops a swelling of the tongue which increases rapidly until the organ fills the entire oral cavity, and often protrudes outside the mouth. In some cases designated as hemiglossitis, the swelling is limited to one side, usually the left. Bennett[5] found from a study of 145 cases that in 85 the entire tongue was involved. In 36 the glossitis was limited to one-half the tongue, and of this number 20 cases were on the left side. Thomas[11] reports one case of hemiglossitis and Duckworth[12] and Copland[13] each report four. In the majority of these the left side was involved. Coincident with the swelling there is a rise of temperature with a corresponding pulse and salivation. The tongue is covered with a dark brownish fur on the dorsum and is tense, dry and hot. Deglutition is impossible and breathing very difficult. There is extreme discomfort and the facial expression is one of great anxiety. The cervical glands are usually palpable.

Butlin[14] says the diagnosis of acute parenchymatous glossitis "is generally so easy that it seems almost unnecessary to speak of it." He states, however, that it is at times difficult to differentiate from acute edematous swelling due to salivary calculus and other affections of the floor of the mouth. Bennett adds acute ranula and herpes of the mouth, lips, tongue or pharynx as diseases from which it should be diagnosticated.

The pathology is simply that of an acute violent inflammation. Thebaud[15] says there is a violent injection and swelling of the lymph-vessels chiefly in the muscular structure of the tongue.

The prognosis of acute parenchymatous glossitis should be guarded, on account of the complications which may arise in all cases. Bennett, however, states that of 145 cases which he reviewed, only four ended fatally, or less than three per cent. Recovery may be by resolution, or suppuration may develop. In some cases gangrene takes place, which renders the outcome very grave.

The treatment should be immediate and surgical. Deep longitude incisions along the dorsum of the tongue on either side of the median line seem to be generally accepted as the best procedure. Sonbeyrau[16] recommends a median incision.

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[8] Gerhard: Codex Medicus, Philadelphia, 1896-97, iii, 42.
[9] Washburn: Med. Rec., New York, 1896, 1, 172.
[10] Green: Med. and Surg. Rep., Philadelphia, 1891, lxv, 333.
[11] Thomas: Marseille med., 1905, xlii, 512.
[12] Duckworth: Liverpool Med. Chir. Jour., 1883, iii, 195.
[13] Copland: Dict. of Med., iii, 1077.
[14] Butlin: Diseases of the Tongue, 1900, p. 69.
[15] Thebaud: Paris Theses, 1893-94.

Sænz[3] after a study of eight cases, states that since glossitis often ends spontaneously, it is prudent to await this, provided no alarming complications develop. Duperier[4] also reports eight cases, but recommends immediate deep longitudinal incisions.

If suppuration has developed, free drainage must be obtained. Thebaud[15] reports 17 cases and in his conclusion states that when a deep abscess develops at the base of the tongue which cannot be reached by the oral route, the same must be attacked from without.

In cases which develop gangrene, cauterization should be used. In addition to the purely surgical treatment, antiseptic mouth-washes should be used freely, together with constant cold applications to the tongue. Pain should be allayed by the use of morphine, etc.

REPORT OF CASE

Patient W. O. A., white, married, aged 50, traveling salesman by occupation, consulted me first November 9, 1910. Patient gave the following history:

Eleven days ago while in the South he began to notice pain in his tongue. He could locate it at no definite point but said it seemed to be in the substance of the organ. The only cause which he could give was that he was in the habit of whittling pine sticks and sticking the splinters in his mouth. He thought he had scratched the under surface of his tongue with one of these splinters. He also had been chewing some fresh perique tobacco. The pain became steadily more intense, especially on the right side, and was more noticeable when swallowing. He remained in the South for several days under treatment, but obtained no relief.

The patient was a well-built, robust man, color good, with facial appearance one of extreme uneasiness. Physical examination, negative. Personal history, negative. Denied syphilis.

Examination of his mouth revealed a somewhat inflamed mucous membrane and several carious teeth. The tongue was apparently not swollen, nor was it especially inflamed. There was a small abrasion which was healing on the right side, but otherwise it was apparently normal. One gland in the right anterior cervical region was slightly enlarged. Temperature normal. The patient was extremely nervous. He said he had taken practically no nourishment for three days. On pressure over the right side of the tongue, far back near the base, the patient complained of excruciating pain.

The patient was sent to a hospital and cold applications to the throat and tongue ordered. Aspirin, 5 grains, was given every three hours. That night the patient slept fairly well and felt somewhat relieved the following morning. An examination of his urine at that time showed some albumin, hyaline and granular casts and a few pus cells.

The relief which the patient had had continued only until the afternoon of the second day in the hospital, November 10. The pain then returned in increased severity. Large doses of aspirin were given and veronal in 5-grain doses, with little relief.

November 12, for the first time, a slight edema around the orifice of the right Wharton duct was noticed. There was still no swelling of the tongue. That afternoon a neurologic examination was made by Dr. S. I. Schwab, but nothing which might be responsible for the pain was found.

By November 13 a most spectacular change had taken place in the tongue. It had become swollen until it practically filled the entire mouth cavity. It protruded from the mouth, was very dry and hot. Temperature 100 F. The patient was semiconscious, breathing very heavily. Nourishment was given by nasal tube and water by rectum.

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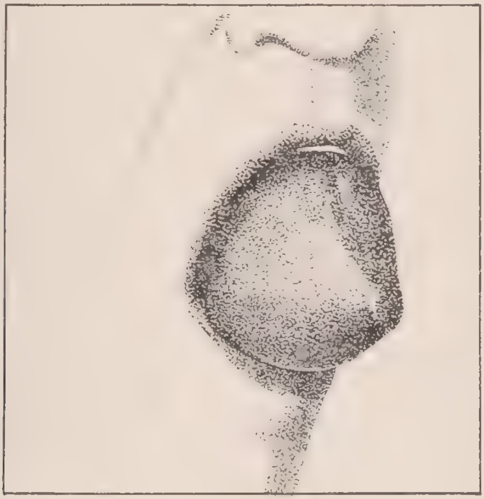
[16] Sonbeyrau: Montpellier med., 1902, ii, 687.

A blood-count was made, showing 12,478 leukocytes. Urine examination showed a large amount of albumin, hyaline and granular casts and a few blood and pus cells.

A consultation was held with Dr. P. Y. Tupper and an immediate operation determined on.

After anesthetizing the tongue with local applications of cocain, I introduced an aspirating needle for the purpose of determining whether or not an abscess was present, and also for the purpose of reducing the pressure by local bleeding. I aspirated ten times in as many different places, and at different depths, but found no pus present. The bleeding was profuse. The patient was put to bed and continuous ice-cold irrigation was applied to the tongue. Nasal and rectal feeding were continued.

Patient had a most uncomfortable night, with severe pain, which was relieved only by a large dose of morphine. Patient felt better by morning. From this time he began to improve. The temperature rose to 101, dropping gradually, and except for acute exacerbations of short duration the pain became less intense. Within four days the tongue had become reduced to such a size that the patient could talk fairly audibly and could swallow without great discomfort. Most of the pain from now on was due to ulcerations on either side of the tongue, caused by pressure against lower right and left carious molars.



Dr. Loeb's case of acute parenchymatous glossitis.

From this time until the patient left the hospital, a period of two weeks, the treatment consisted of cold applications to the tongue and applications of argyrol in 25 per cent. solution, to the ulcerated areas. After leaving the hospital the patient gained strength rapidly and on January 3, 1911, was pronounced entirely well. He was treated by Dr. J. S. Myer for his acute nephritis, from which he also recovered.

537 North Grand Ave.

ABSTRACT OF DISCUSSION

Dr. Gordon New, Rochester, Minn.: About three weeks ago I saw a case almost as extensive as this, following an abscess at the root of a third molar tooth. The patient recovered, however, after drainage in the submaxillary region. Other than this I believe there is nothing to record about the case.

Dr. F. B. Moorehead, Chicago: It is difficult at times, if not impossible, to make a differential diagnosis between parenchymatous and interstitial inflammatory conditions excepting, of course, microscopically. A boy of 17 was sent to us with a history of acute abscess from the lower incisor tooth. The tooth had been extracted some ten days previous, and following the extraction an extensive swelling had developed, more in the floor of the mouth than in the tongue, which had the appearance of a typical Ludwig's angina. The swelling went backward and the patient had difficulty in swallowing; the tongue began to enlarge and completely filled the mouth. The swelling in the lower part of the mouth and tongue made tracheotomy necessary. The pain was very severe; temperature 102.

Dr. Theodore Blum, New York: What was the infection from which this came?

Doctor Moorehead: A simple alveolar abscess, I imagine. I did not see the case until the original focus had cleared up, the patient coming to me with a.mass of induration on the floor of the mouth.

Doctor Blum: Was a Roentgenogram taken?

Doctor Moorehead: Yes, but it showed nothing except the empty socket from which the tooth had been removed. There was no other bone involvement.

Dr. M. I. Schamberg, New York: The cases of glossitis that we come in contact with are usually secondary to other disturbances, as stated by Doctor Moorehead. The description of the case which Doctor Moorehead has given us is identical with a case which recently came under my care, in which the suppurative site was in the submaxillary region and had extended to the tongue, so that the tongue showed a certain amount of the extension of the inflammation. Another patient was sent to me as a case of glossitis showing evidence of swelling in the tongue in which the physician in charge suspected a specific origin. The history of the case as obtained from the patient showed no history of an initial lesion. The patient was married, his wife had borne several children and there had been no miscarriages. On examination I determined, with some difficulty, a slightly ulcerated spot on the lateral aspect of the tongue in relation with two or three molar teeth. This they attempted to explain because of the swollen tongue coming in contact with roughened teeth. I was, however, suspicious that the case was malignant and took a fairly good section from that portion of the tongue and sent it to one of the best pathologists in New York. The report came back that it was not malignant. In spite of this, I persisted in the view that it was malignant and that we had not reached the tissue showing the typical pathologic changes. The case passed out of my hands at that time because the physician called in someone else for a Wassermann. A positive Wassermann was found and the case was treated with salvarsan. There was an improvement, and I was also informed subsequently that the lesion that was removed from the tongue was malignant. It is important in these carcinomas of the tongue to remember that they are often deep seated and that the removal of superficial tissue will not determine it. I thought I had gone well into this ulcerated region and that I had obtained some of the involved tissue, but the diagnosis was made absolute by the pathologic finding after the removal of the tongue.

These tongue cases are exceedingly malignant and the only salvation is to see them as early as possible. In another case there was a slight ulceration on the side of the tongue which attracted attention. The patient was sent to a physician who diagnosed it as an initial lesion of syphilis and treated the patient for cancer. When the patient came to me the tongue was well indurated beyond the median line. I advocated the removal of the tongue, but the patient would not consent to the operation and went to an untimely death six months later. The only chance in these cases is to make an early diagnosis and they should be looked on with grave suspicion, particularly cases of glossitis that do not show suppurative lesions or in which the blood-count does not indicate the presence of disease in the system.

Dr. A. H. Levings, Milwaukee, Wis.: So far as my experience goes, practically all of these cases are due to infection. It may be either streptococcic or staphylococcic. The point of infection we may not be able to determine, but it is usually some scratch or abrasion as from a roughened tooth, or it may be the sting of an insect. I have never seen a case of parenchymatous glossitis that I thought I could not differentiate from carcinoma. Doctor Loeb's treatment of the case I think was excellent; either make numerous punctures or make a free incision, the idea being to deplete the tissues, cause free hemorrhage, and get rid of the infection.

Dr. Virgil Loeb, St. Louis: I had intended to make a deep incision, but finding no pus present and getting satisfactory results by aspiration, there was no occasion for such a procedure. In differentiating from any malignant disease of the tongue, I examined the patient thoroughly before the swelling developed and there was no sign of induration.

PRESIDENT'S ADDRESS*

BY DR. W. H. CALDWELL, WHEELING, WEST VIRGINIA

WE ARE AGAIN ASSEMBLED in annual meeting, and as your presiding officer, in fulfillment of one of our customs, I rise to give you what is known as the president's address. I wish first to thank you for the honor conferred in selecting me to be your president, the eighth of the society.

I can assure you that the work has been most pleasant throughout the year. My associations with the several committees of the society to whom the credit of this meeting belongs, has been both helpful and pleasant.

This is the age of progress and efficiency, both of which are based upon experience, and the application of what has been found good, and the elimination of what has been found worthless. There is not a subject of importance today but what has had concentrated upon it the thought of the best minds of the country. It is so with scientific and economic problems of the day; it is so with medicine and surgery, chemistry and electricity, in national, state and municipal problems; and I am glad to say it is doubly so with our own branch of the healing art.

Now that the whole thought of the day is advancement and efficiency, how are we to do our part in this vast movement? Each one of us has his part to play, as a member of the local society, as a member of the state society and as a member of the national society. We are all but units in this one vast scheme of advancement; so let no man fail in doing his part to uplift and enlighten, to learn so that he may teach, and thereby do his duty to the public to the fullest measure.

The Scientific Foundation and Research Commission of the National Association to this end should receive some consideration from this society. The work now being carried on by the commission will most certainly enable the individual dentist to keep himself always in the forefront in the advancement made in our profession.

At the meeting of the surgeons of North America, held in the city of Chicago more than a year ago, Dr. Chas. W. Mayo, that noted surgeon of Rochester, Minn., made this statement in closing his paper: "The next great step in solving the question of preventive medicine must be taken by the dentists. The question is, will they do it?" I feel certain that Doctor Mayo was not aware of the forces or agencies at work at that time. And surely had he heard Doctor Hartzell's paper on "Studies on Relations of Systemic Infections to Dental Foods," read at the National Association meeting at Rochester, N. Y., this year, he would have said that the dentists were wide awake and active, loyally supporting their part in the great fight against disease, through preventive measures.

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*Read before the West Virginia State Dental Society, 1914.

ORGANIZATION

Our society at this meeting is to pass upon a new constitution and by-laws, so as to conform more generally with that of the National Association, of which we are a component. The committee having this matter in charge has the completed changes suggested and the same will be open for discussion at the proper time. It is well at this time to speak of one feature this society should bear in mind, namely, that of dental education. Our colleges realize that their curriculum is not broad enough to meet the requirements of the day, and to that end are adding one year to their course, leading to the degree of Doctor of Dental Surgery. The significance of this is that the dental societies are facing a condition like this: the graduates of the next few years will start into practice with a more thorough training in the basic fundamentals than we now possess, and it seems to me that some action whould be taken by this and every dental society to acquire this additional knowledge. Therefore, I recommend that a committee be appointed by the executive council to pass upon the advisability of this society taking up post-graduate courses. Further, I recommend that the district societies organize study clubs, that scientific courses be planned and worked out, that the men best qualified be designated to have charge of the work; that papers or lectures be given upon subjects interesting to all, thereby promoting a keener interest in our chosen work.

THE APPOINTMENT AND DUTIES OF COMMITTEES

The rule for the appointment of committees should be more closely followed. Not that the committees of the past or present have not always fulfilled their duties, but have always discharged them with credit to themselves and to the society. Therefore, I make this recommendation that the president, together with the executive council, hereafter appoint all committees.

ORAL HYGIENE AND PUBLICITY

Oral hygiene having assumed such an active position in the several states, and with such remarkable results for the good of those receiving the instruction, and the fact that it has received recognition not only in the several states but also by the United States government, it is suggested that the society take some action whereby the work along this line, already started in our own state, be broadened, and the attempt should at least be made to have the state superintendent of schools include in the teachers' institutes, lectures on this most important subject. Dental caries, or tooth decay, is the most prevalent of all diseases that attack the human body, and it is recognized as being largely preventable. There is no doubt that under appropriate treatment fully three-fourths of all dental diseases can be eliminated, and thereby the individual's physical condition be greatly improved, and the possibility of the teeth and mouth being carriers of communicable diseases greatly reduced.

Personally, I hold that we, as an organized profession having knowledge of these facts, are not doing our duty or at least not fulfilling it to our fullest capacity if we fail to call attention of the proper officials of our state educational boards to these conditions.

LEGISLATION

Our constitution and by-laws call for a committee on legislation, and define their duties. In addition to this it would seem advisable for each district society to have a similar committee to work in harmony with the state committee. Valuable assistance can be rendered to the state committee in quick action in the matter of securing aid of the delegates and senators from their districts, and in keeping to the highest standard our dental laws, and in watching over legislation which might prove antagonistic to our privileges of practice. I make this last statement advisedly, as not long since the attempt was made to pass a law in congress under which, if it had become a law, no dentist could have used any drug to alleviate pain.

MEMBERSHIP

Hereafter all new members of the state society must come through the district or component societies, unless the district is without a society, in which case the application must be filed with the state committee for action. It is to be hoped that the district societies will take a broad view of this provision of our constitution and not allow personal feelings to work against the admission of any ethical man to their society.

The success of any society is more or less in the hands of its officers, and it is to be desired that at all times the members will give their loyal support, if called upon to read a paper, give a clinic or serve upon a committee. Your action is and will be a good example to others, will aid materially both in building up your own ability and encouraging others to greater effort.

Success depends upon your rendering able and efficient services. To this principle we must add personality, hope, faith, courage, application, charity, confidence and trust in our fellow man. Our position in the world today is not an accident; it has been bought and paid for by the courageous self-sacrifices of those men, the pioneers of our profession who have passed away. Necessity, the mother of invention, has given us in our short history many geniuses. These men we should honor and always appreciate what they have given us.

In conclusion let me admonish the members to ever hold high the honor of our chosen profession, so that when our work is done, our every act will be used as markers along the highway of advancement and efficiency for the upbuilding of dentistry.

OSTEOPLASTIC SURGERY OF THE FACE*

BY W. WAYNE BABCOCK, M.D., PHILADELPHIA
Surgeon to the Samaritan Hospital

ALTERATIONS OF THE FACIAL CONTOUR BY THE IMPLANTATION OF FAT

THE MODIFICATIONS THAT THE FACIAL CONTOUR undergoes in the adult are dependent chiefly on alterations in the amount of subcutaneous fat. In the operative modification of the facial contour no substance is as well adapted for the purpose as adipose tissue. Bits of free homoplastic fat, when properly imbedded subcutaneously, find ready attachment, do not provoke serious inflammatory reaction and retain, after vascularization, their storage capacity for hydrocarbons. Transplanted fat may under conditions of increased nutrition undergo a certain amount of hyperplasia, and may waste during starvation. The transplanted fat when vascularized, remains fixed in position and, unlike paraffin, when imbedded under the skin, shows little change in outline, does not produce hyperemia of the overlying skin or marked fibroconnective tissue formation. In 1907 I[1] reported several operations in which free transplants of fat were used to isolate nerve trunks that had been subjected to operation. Recently Binnie[2] has reviewed the literature and has indicated many operative procedures in which free transplants of fat are of value.

My attention was first directed to the advantage of fat transplantation for the correction of facial deformity by a patient who had suffered extensive necrosis of both cheeks following the injection of paraffin by one of the most widely advertised "beauty doctors." The disfigurement was so great that the patient had been a recluse for six years. After excision of the scar tissue and the formation of cutaneous flaps, the depression remaining on the one side was so noticeable that finally a flap of fat was dissected subcutaneously from over the malar bone and turned down and imbedded, giving a satisfactory cosmetic effect. Later a patient presented himself with a marked facial asymmetry from lack of development of the lower jaw, particularly on the left side, following an ankylosis of twenty-four years' duration. After a bilateral arthroplasty a segment of one of his costal cartilages was implanted in the chin, and finally through an incision placed underneath the edge of the mandible, a subcutaneous pocket was formed and the sunken left side of the face contoured with bits of fat taken from the subcutaneous tissue of the patient's abdominal wall.

The implantation of the fat is useful after the removal of tumors or the liberation or resection of scars which leave secondary unsightly depressions. Fat may also be implanted for bony disfigurements, as after impacted fractures of the malar or frontal bones. After disfiguring operations, as on the frontal sinuses, and for certain congenital or acquired deformities such as receding chin, asymmetry of the maxillary bones and the like, the implantation of fat is useful. For the subcutaneous imbedding of fat the cutaneous incision need not be large, and should, if possible, be placed at some inconspicuous point as along a normal wrinkle line or beneath the jaw. The subcutaneous tissues are separated by a knife or by tunneling with blunt-pointed scissors. After arresting hemorrhage, bits of fat of sufficient size to correct the deformity are introduced and held in the pocket, which obviously must be of proper size and situation, by subcutaneous sutures of fine catgut. We have usually found it undesirable to suture the fat in position, as this prevents the adjustment of the imbedded fat to the containing cavity. The fat may be introduced in the form of small portions or strips and the subcutaneous closure should be sufficiently tight to prevent any extrusion of the fat from the limiting pocket. The skin is finally approximated by an intracuticular or very fine epidermic suture. Fat may be obtained from the adjacent subcutaneous tissue or from the abdominal wall. We have, thus far, not employed fat from another person. Although we have used larger quantities of fat in the restoration of the contour of the breast after the removal of benign tumors than are usually required in facial surgery, we have had no suppuration or evidence of absorption of the imbedded tissues.

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*Read before the Section of Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

[1] Babcock, W. Wayne: Nerve Dissociation, Ann. Surg., November, 1907.

[2] Binnie: Surg., Gynec. and Obst., February, 1914.

THE CORRECTION OF SADDLE-NOSE

In certain cases in which the bridge of the nose has been lost without destruction of the tip or alæ, a satisfactory bridge can be formed of metal, cartilage or bone. We have employed portions of a rib, costal cartilage, and tibia, the last method presenting certain advantages. An incision about one inch long is made from the base of the nose upward in one of the wrinkle lines of the forehead and is carried to the bone. With blunt-pointed scissors or a separator carried close to the nasal bones, the soft tissues over the bridge of the nose are thoroughly separated and elevated. A tibial transplant is removed, cut to appropriate shape, and after arrest of oozing is slid into position from the frontal incision, its ends respectively abutting against the frontal bone, and the cartilage just a short distance above the tip of the nose. If necessary, two or more short strips of bone may be superimposed. The deep tissues are closed with fine catgut and the skin by subcuticular or delicate epidermal sutures. The operation has the advantage of simplicity, slight disfigurement, of a location of the incision in an area susceptible to sterilization. Local anesthesia suffices. In one instance, after paraffin had failed to maintain its position, we split the tip of the nose just above the nares and imbedded a section of costal cartilage with excellent immediate effect, but infection and extrusion of the fragment followed.

THE CORRECTION OF SKULL DEFECTS

Silver plates placed under the scalp to cover defects in the skull present a large area of metallic surface that stimulates serous secretion. In a very limited experience we have found it necessary repeatedly to evacuate such secretion until finally infection has occurred and it has been necessary to remove the plate. In two instances we have remedied the defect in the skull by bridging with Lane plates which were so bent as to conform to the contour of the skull and were firmly fastened to the bone by screws. In the first instance the large flap of bone which had been separated fell to the floor during the operation and, of course, was not replaced. The patient was relieved of Jacksonian epilepsy but a large depressed area remained in the parietal region which, as he bent forward, filled and caused so much vertigo that the man could not work. The disfigurement and symptoms were relieved by the use of the Lane plates, the thickened dura being lifted and fastened to the steel bars by interrupted sutures. In a second patient, a leutic woman, a disfiguring defect in the frontoparietal region was first partially corrected by a silver filigree. The silver filigree caused no irritation but was so soft as to become depressed and we later removed it and substituted Lane plates with the satisfactory cosmetic result.

IMPROVISED METHOD OF CORRECTING DEFECTS OF THE MANDIBLE

Modified Lane plates fastened to the bones by screws may be used in an emergency to take the place of absent portions of mandible. In one of our patients a large part of the left side of the face including the ramus and part of the body of the lower jaw was blown away by the charge from a shotgun. After operations to overcome the ankylosis and to restore the lining and covering of the cheeks, one arm of a three-pronged Lane plate was broken off and the plate fastened to the body of the jaw so as to form a new angle and a new ramus. Despite the attenuated and densely cicatricial tissue in which this flap was imbedded, it was worn with great improvement for over six months, being finally removed because the sharp rough angle of the plate penetrated the skin and produced a slight sinus without, however, much irritation.

RHINOPLASTY

In the Italian method of rhinoplasty in its original or one of its modified forms, it is usually desirable to swing a pedunculated supraorbital flap down on the nose, leaving a defect in the lower part of the forehead that must close by granulation or skin grafting. We have found it of advantage in such a case, after removing the flap, to make a second incision close to the hair line, and, after mobilizing the tissues of the upper frontal region, push them down and accurately fill in the gap above the eyebrow. In this way little disfigurement remains in the lower part of the forehead and the granulating cicatrix is left close to the hair line where it may be covered by a hat or by a suitable dressing of the hair.

ENLARGEMENT OF THE EXTERNAL NARES

Much attention has been given to obstruction in the upper air-passages, and the influence of such obstruction, whether in the nose or pharynx, on the shape of the mouth and the development of the bones of the lower part of the face, requires no further emphasis. Apparently, however, little attention has been paid to obstruction due to the small size of the external nares. Fortunately, by resection of the skin and thin cartilaginous walls above the nasal openings, small and round nasal openings may be converted into fair-sized keyhole apertures. With a very sharp knife, wedge-shaped incisions are made. Great accuracy in planning the incisions is necessary to produce satisfactory symmetry of the two openings, and if the surgeon has not considerable dexterity it may be better to enlarge each opening by a punch to ensure uniformity.

The wound edges, after the wedge-shaped excision, are accurately united by fine horsehair sutures and permitted to heal without an external dressing under a scab. The stitches should be removed on the second or third day, by which time primary union will usually have occurred. By this method it is possible to increase the nasal aperture a third or more and to give the patient a corresponding relief from his external nasal obstruction.

2033 Walnut Street

ABSTRACT OF DISCUSSION

Dr. M. I. Schamberg, New York: I am particularly interested in Doctor Babcock's method of transplanting fat from one portion of the body to another, and it sounds like a decided step in advance. The only question raised in my mind was whether or not that fat would in time be resorbed. I would be glad if Doctor Babcock would outline the behavior of this fat and the length of time that it will remain after the operation. I wonder whether he has had such an experience in using steel screws as I have had, in that they become badly rusted owing to the amount of oxygen in the tissues and the amount of moisture we find there. I do not believe much in Lane plates. I have not had recourse to the Lane plates but have had a case in which I was operating for marked prognathism, in which I took out a section of the jaw on both sides and brought the jaw back and held it in place by steel plates, which I removed subsequently. They were badly rusted and I believe were a source of irritation. I imagine the Lane plates retained only for a short time would do no harm. The results in this particular case of marked prognathism, however, have been as ideal as any I have seen. In another case a man who had been operated on in another department of the Post Graduate School of Medicine had lost his entire nose, save a little tip which flapped up and down and in which the opening afforded a full view of the nasal chamber and the accessory sinuses. In this case we are desirous of doing a cosmetic operation. Doctor Mitchell has devised a plan to restore the bridge between the nose and the mouth, and we are going to make a frame-work to be attached to a plate in his mouth and to run up into the nasal chamber. It will be cleansed through the mouth. The top of this appliance will be held in position, and the plastic work done over this frame-work. The skin can be folded over from the forehead, and I think we can give the patient a fairly good contour over the nasal chamber. The cleansing can be done by irrigation through the nostrils, or by the removal of this plate in his mouth, which will be supported by several teeth. We shall endeavor not to have any pressure on the bony structure above so that there will not be any resorption in this region. In another case a good portion of the jaw was removed from immediately above the angle to the bicuspid angle, and the remaining parts were held in place by silver plates riveted directly to the bone. This case resulted beautifully from a mechanical point of view. The patient immediately after the operation was able to open and close the jaw, and to masticate with absolute articulation, but six months later the bone to which the silver plates were anchored necrosed and we had to remove the plates. I am not much in favor of permanent metallic attachments to bone as it interferes with the filling in of the tissue.

Dr. H. S. Dunning, New York: Will Doctor Babcock state how the Lane plates are held in when a greater part of the bone is carried away—whether they are attached to the end of the bone or to the soft tissues?

Dr. Wayne W. Babcock, Philadelphia: Many of these things have been alluded to in a fragmentary way and of course require working out. As to the permanence of the irritation in tissues produced by the Lane plate, I think it is largely a matter of infection. With a clean Lane plate imbedded or fastened to the bone, and without infection, I have seen no marked corrosion. Some of these I have seen in place for a number of years in connection with long bones. In one case the plates remained for three years and caused no irritation. Some of these plates were fastened with silver screws, and some with a steel alloy screw which is supposed to be non-tarnishing, though it does tarnish. I think if we have an opening and access to outside air, trouble usually ensues from this oxidation. That is the particular trouble in operating about the jaw; it is so hard to put these plates in the jaw without some communication from the outside, and that means, usually, that sooner or later the plate has to be removed. In one case we screwed the fixed Lane plate to a portion of the bone proper. It was fastened by two screws in front and fixed firmly and at rest in the tissues. In that case if the plate had been smoother I believe it would have been retained, because when the plate was finally removed there was no marked corrosion. As to the resorption of fat, for about twelve years we have been transplanting skin with the subcutaneous tissue to other parts of the body and we notice that as the tissue improves in nutrition, the fat with the subcutaneous layer becomes larger, so much so that at times it gets in the way. Apparently as the general tissue improves, tissue taken from the abdomen and put on the hand or arm will increase also. In a number of cases we have found it necessary to cut away fat which had so increased in size, and in the tissue removed the vascularity was perfect. I have under my care now a case of transplantation of fat which shows every evidence of softness of the tissue and the maintenance of the contour and vascularity. It seems that the storage capacity of the fat for carbohydrates has been transferred with the growth and is still being maintained.

APPLIANCE FOR THE TREATMENT OF RIGGS' DISEASE

BY W. T. DAVIS, D.D.S., WARSAW, ILL.

Take a modeling compound impression, in a full upper or lower tray, enlarge the impression made by all the teeth. Cut a continuous gate ending in two openings with the median line between each hole; apply the antiseptic solution you choose in one hole—the other acts as an outlet.

Take engine drill and make two holes on each side of median line after impression is taken, open up holes to get inside of impression.

HEALTH CONSERVATION

ESSENTIAL FACTORS IN ESTABLISHING AND MAINTAINING A HIGH STANDARD OF PUBLIC HEALTH*

BY HOMER C. BROWN, D.D.S., MEMBER STATE BOARD OF HEALTH, COLUMBUS, O.

APPRECIATING THE FACT that we are very fortunate in having a number of prominent speakers present, as contributors to this evening's program, I am prompted only briefly to discuss the subject assigned, and then only in generalities.

Some may question the appropriateness of a dental organization taking such an active part in matters relating to general health questions. However, I am of the opinion that by the presentation of such a program as has been prepared for this session, and bringing together the interests that are here represented, we are raising our professional standards and stimulating our members to appreciate that the responsibility for much of their work is not necessarily limited to the oral cavity and its organs. Imperfect dental operations, especially faulty treatment and filling of root canals, is recognized as being responsible for many pathological conditions that may develop in remote parts of the body.

The Ohio State Dental Society has gone on record as favoring many progressive health movements and I will refer to one wherein I think it was fortunate enough to be the first state organization to give endorsement to a meritorious recommendation. This society was holding its 1909 session when President Taft's message to Congress appeared in the public press. One of his recommendations was the establishing of a National Bureau of Health, and I prepared and presented the following resolutions, which were unanimously adopted:

"*Whereas*, In recent years there has been a decided and far-reaching movement, in both the medical and dental professions, toward establishing prophylactic and sanitary measures to the end that disease and unsanitary conditions may be reduced to the minimum, and

"*Whereas*, The President of the United States, in his recent message to Congress, recommends the creating of a National Bureau of Health; therefore be it

"*Resolved*, That the Ohio State Dental Society most earnestly endorses the establishing of such a bureau and pledges its loyal support to such a bill; and be it further

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*An address before the Ohio State Dental Society, Dec. 1, 1914.

"*Resolved*, That the secretary be, and is hereby instructed to mail a copy of these resolutions to President Taft, the Ohio Senators and Congressmen, and that the same be spread upon our records."

Public health is both a social and an economic question. It also has a political significance, inasmuch as the work of the health department of a state, or any of its subdivisions, is only one of several departments which should be consistently working together for the best interest of the citizens within its jurisdiction.

From an economic viewpoint, society is divided into two classes: producers and non-producers. The one is a positive asset and the other is an equally positive liability, and it is to the interest of all to increase the productive class and to decrease the non-producers in every possible way. The efficiency of the individual, regardless of what his position may be, counts for more today than at any previous time and whatever can be done to raise this or to increase the productive units should be encouraged and should receive liberal financial support.

Health and sickness are only relative terms. Those fortunate enough to be possessed of the former must be educated, if need be, to assume many of the responsibilities of those less fortunate, thus answering the question, "Am I my brother's keeper?" Those afflicted must also be educated, not only in matters pertaining to their own welfare and comfort, but they should be thoroughly impressed with the necessity for using the utmost care in not unnecessarily exposing others to the disease responsible for their ill health.

Polluted water supplies, contaminated food supplies, insanitary surroundings and unhygienic living, associated with a lack of regard for the welfare and rights of others, are responsible for most of the preventable diseases. These conditions, and the diseases resulting therefrom, are largely due to ignorance, indifference or neglect. They were formerly considered as individual responsibilities, but are now very properly classed as problems of public interest and for public control, and it should be one of the first duties of those in positions of authority to recognize and enforce every precaution which will in any way conserve the public health and increase individual efficiency.

Many recognize that the "death rate" and the "tax rate" have a positive relation to each other and that health is the first requisite in the progress and happiness of a people. When this is more generally appreciated it will not be a difficult task to secure the necessary material and moral support, be it public or private, individual or organized, to maintain a higher standard of public health. Any progressive movement that has for its purpose the alleviation of pain, disease or distress, or for the bettering of humanity in any way, is not only commendable as an economic measure but also because of its humanitarian influence.

Health and other public officials, educators, physicians, dentists, philanthropists and social workers should recognize both the economic and humanitarian aspect of this subject and use their influence in emphasizing *prevention* rather than *cure.* Such influence will be a positive factor in establishing and maintaining a high standard of public health. When this is supplemented by the co-operation of an educated and an appreciative public, rapid advancement in race betterment will necessarily follow and the chances for the new-born babe to be "well born" and raised under favorable environment, which should be its right, will be somewhat increased.

In specifically enumerating some of the "essential factors in establishing and maintaining a high standard of public health," I name the following:

First—Education and Publicity. Three methods of education can be considered in this connection. *First*, that received in our common and private schools and other educational institutions. *Second*, that which may be promulgated through a public health educational campaign, such as the Ohio State Board of Health is conducting in the state at this time. *Third*, the educational publicity work of the local press and the popular magazines.

Second—The Appreciation and Co-operation of the Public. No department of state or municipality can do its best work without the moral support and encouragement from those whom they serve. They must not only have this moral support but they must have loyal co-operation in order to produce best results. Especially is this so in times of epidemics, floods and other extreme conditions.

Third—Adequate Legislation. It is necessary from time to time to enact new legislation relating to public health matters and the increasing of the appropriations in keeping with the new developments. Nearly all legislation that is for the public good is usually the result of a campaign of education and publicity. That relating to the health of a community has so many arguments in its favor that it should not be a difficult thing to secure favorable consideration of any reasonably progressive health laws.

Fourth—The Co-ordination of Allied Departments. In order to secure best results in any department of state, and this applies alike to all its subdivisions, it is very important to have all the allied departments working together in harmony. A well directed, intelligent and practical co-operation of such departments, agencies and institutions, both public and private, will eliminate much duplication of effort, wasted or misapplied energy, or working at cross purposes, thus making possible maximum results at a minimum of expense.

Fifth—Competent Administration. All of the foregoing are essential factors, but they will fail in accomplishing the best results unless the administrative body is fully competent to carry out the provisions of the legislature, local ordinances, or other adopted rules and regulations. The State Board of Health and its staff feels the need at this time of raising the health standards in various localities. Especially is this desirable in villages and townships, and it is hoped that some new legislation may soon be enacted that will permit of placing the health officials in such communities on a higher and more uniform basis.

I am fully convinced that I express the sentiment of the Ohio State Board of Health and its staff in saying that such support and influence as may come from the Ohio State Dental Society and the other organizations, institutions and interests here represented, will be very much appreciated.

The active co-operation of all these are of the greatest benefit and such moral encouragement is a stimulant to increased effort.

The health interests of the state have been very fortunate in having the loyal and consistent support of Gov. Cox, and in their behalf I take this opportunity of expressing our appreciation. We further express the hope that his successor will take an equal interest and render such support as the importance of the service merits.

THE FLAT LOWER JAW PROBLEM

FOR THE YOUNG DENTIST

BY DR. L. P. HASKELL, CHICAGO, ILL.

Nothing in prosthetic work gives the dentist more trouble than the flat, or ridgeless, lower jaw.

The trouble lies in the fact that absorption has taken place to such an extent that the lingual muscles are attached at the margin of the jaw so that the plate cannot extend over the margin.

An experience of twelve years in my own mouth with this condition has taught me some things I would not otherwise have learned.

Upon placing my finger just a little over the margin and holding it tight, upon lifting the tongue, the finger is forcibly removed.

I find that by the extension of the gum, outside of the posterior teeth, from the second bicuspid back, and in width 3-16 of an inch, not down to the margin of the plate, when it would have been lifted by the muscles, but midway between margin and necks of the teeth.

The cheeks lie in the groove and help hold the plate down. One proof of this is when I eat berries, the seeds do not get under the plate.

Upon putting in a lower plate I say to the patient, "It is far more liable to irritate than an upper plate, and if it does you cannot eat. Come with the plate in the mouth so I can see where the irritation is."

Sometimes it is difficult to exactly locate on the plate the exact spot. Moisten a little whiting, and with a spatula place a little bit on the spot, replace the plate and on this you will see where to relieve with a small carborundum.

A heavy plate is not advisable because it slides about in certain positions of the head.

Tell the patient it requires longer time to learn to eat with a plate like this than when there is a ridge.

EDITORIAL

Just a Word of Caution

The old adage, "Make haste slowly," is worthy of more than a passing glance, especially in these days when dentists and physicians become over enthused with ideas and suggestions of so-called panaceas, and laud their use before they have been thoroughly tried and proven of worth.

Cataphoresis and many other fads were enthusiastically accepted by dentists, only to be discarded after the "craze" had run its course and a thorough trial had proven them impracticable or worse.

Now the enthusiasts are claiming so much for general systemic infection from devitalized teeth that every pulpless tooth is looked upon as a menace to health and it is driving dentists to ruthless extraction. Undoubtedly some abscessed conditions of the teeth may contribute to systemic disease, but it is little less than criminal to convey the idea that all devitalized teeth are a menace.

If our root canal operations are faulty, it would be far better for our investigators to find more efficient methods of root treatment and filling than to recklessly advocate the removal of pulpless teeth. The vaccine craze for the treatment of pyorrheal conditions of the teeth has come and gone.

In a paper published recently in The Dental Summary, Doctor Emerson states: "As for me, I do not believe there is a smithereen of value in the vaccine treatment." In last month's Summary, Doctor Talbot makes the emphatic statement that the amœba is not the cause of interstitial gingivitis.

In an article by Doctor Mewborn, in this issue of the Summary, the author scouts the theory of the entamœba buccalis being the specific cause of pyorrhea, or of emetin being the specific cure.

In discussing Doctor Mewborn's paper, Dr. L. G. Noll says: "Up to this date we have seen nothing, either in the theory or practice of Doctors Barrett and Smith and their numerous disciples, calculated to win our faith, and when the essayist says their theories were announced with indecent haste, we do not think his language too strong, for they did not, as pointed out by Doctor Talbot in May *Cosmos*, wait until they had proven their charge against the amœba by applying the law of Koch, i.e., growing the organisms in pure cultures and producing the disease by inoculation into tissues of a healthy subject." And continuing, he says, "We have only to review the past, as far as our observation and memory extend, to learn caution in accepting new theories in medical and dental practice. Our immediate past is strewn with the wrecks of discarded theories, and the costly but now useless apparatus we purchased with which to test them in our practice. Physicians and dentists have always been faddists, and probably always will be."

We do not wish to convey the idea that we are opposed to new things, but we do desire to caution investigators regarding the presentation of theories and cures until they have been thoroughly tested and found to be of value. And to impress upon dentists the advisability of adopting them cautiously until their worth has been proven.

"Make haste slowly. Prove all things and hold fast to that which is good."

Disease of Metals

The thought of stability is suggested to us when we are dealing with metals, but even metals, relatively so stable, are susceptible to intermolecular modifications, especially under the influence of changes of temperature and mechanical pressure.

Aside from these normal molecular alterations, there is a group of phenomena, so far given little study by chemists and metallurgists, and these are the so-called "diseases of metals." In writing of these diseases, Prof. Julius Meyer says that a metal hitherto intact and efficient in all its relationships, will suddenly fail at some spot or perhaps in several places at once. There will be discoloration, loss of temper, brittleness and presently a total decomposition—the disease spreads from its center or centers until the whole piece is sympathetically affected. The disease can, moreover, be communicated from one piece of metal to another.

The number of metals affected by disease is small, and amongst this number tin is the greatest sufferer. A change from a cold to a warm temperature will arrest the disease, and avoidance of a very low temperature will prevent it altogether. So it must be assumed that tin is capable of various forms of crystallization.

More interesting than that of tin plate is that of tin foil. Let several highly-polished sheets of tin foil be laid upon a diseased sheet of tin and pressed gently against it for some hours at a temperature of from 150°-180° in a dry cabinet. Gradually spreading patches will appear upon the sheets of tin foil. The tin becomes brittle and falls away in a fine powder.

Iron, nickel and zinc are capable of similar allotrophic change but the transformation is not nearly so destructive as in that of tin; again, objects made of tin, brass and some other metals will, sometimes after a short period of use, display flaws which presently become brittle patches.

Apparently this newly-observed modification takes place only where metals are subject to pressure, rolling, stamping, smelting or any process where great mechanical resistance is demanded. This circumstance has caused it to be named "force sickness." It appears to occur much more frequently than one would suppose. Once this disease has made its appearance, it can easily be communicated by means of contagion both to objects made of the same metal and to those isomorphic with this metal, which have, in other words, an identical crystalline formation, if brought together under pressure. The internal metamorphosis of the diseased metal is best exhibited in the case of brass, where a process of recrystallization is readily observed.

In this case it is supposed that mechanical interference has destroyed the original structure of the metal, a structure determined by the identity of weight in the molecules and it would appear that the disease may be described as an effort at recrystallization.

Bad Teeth a Cause of Cancer

Constant irritation of any part of the body is now well recognized as an important contributory cause of cancer. One of the forms of irritation which has been repeatedly observed to result in this disease is the constant friction of the sharp edges of bad teeth or of imperfect plates against the sides of the tongue. To be sure, sores on the tongue caused in this way do not always become cancers. Neither are wounds from toy pistols always followed by lock-jaw. But there is danger in both cases, and it is as easy to avoid it in the one as in the other. A bad tooth should never be tolerated in any event, and the danger of cancer is only one more good reason for having it attended to. Cancer of the tongue may occur at any age, but it is most common between 40 and 60. Statistics show very few cases under thirty. The majority of these cases occurred in females, while in later years males were found to be more frequently attacked. Cancer of the tongue in young subjects is especially fatal. Out of thirty cases there were only two recoveries. The others died within ten months or could not be traced. As one-third of all the cases investigated have been shown to be definitely associated with jagged or decayed teeth or imperfect plates, it would seem that here, at least, is one method of preventing cancer. It is probable that other conditions occurring in combination with the bad teeth increase the likelihood of cancer of the tongue as a result, but the removal of this form of irritation is so simple a matter that deaths in cases of this kind must be mostly charged to pure neglect. Where a sore place caused by a jagged tooth does not promptly heal there is real danger of cancer. If the removal or treatment of the tooth does not relieve the situation and the ulcer continues, prompt operation is necessary, for this form of cancer is quickly fatal.—*Journal of the American Medical Assoc.*

OBITUARY

Samuel Smith Nones, D.D.S.

Three Generations of Dentists, March 27, 1909
Samuel Smith Nones—Robert Hodgson Nones—
Robert Hodgson Nones, Jr.

SAMUEL SMITH NONES, D.D.S., son of Capt. Henry B. Nones, U.S.N., and Anna H. (Rino), was born April 22, 1837, at Staten Island, N. Y., and died June 10, 1915, at Narberth, Pa., of Bright's disease, and was buried at Wilmington, Del., June 12, 1915.

Doctor Nones married Harriet Alexander Hodgson, January 15, 1863, at Wilmington, Del., who died May 8, 1882. September 29, 1885, he married Elizabeth Cooper, of Philadelphia, Pa., who died August 17, 1907.

Doctor Nones commenced the practice of dentistry in Wilmington, Del., having been graduated from the Pennsylvania Dental College in 1859. He moved to Philadelphia in 1864 and practiced until a few years ago.

He was one of the charter members of the Pennsylvania Dental Society. Two sons and a daughter, Dr. Robert Hodgson, Mrs. Ida Wiley and Dr. Henry Benjamin, by his first wife, and Albert C., by his second wife, survive him. He, with his son, Robert H., and Robert H. Jr., comprised three living generations of dentists. There are few if any similar cases in the country. Henry B., another son, is also a dentist.

Dr. Faneuil D. Weisse

Dr. Faneuil Dunkin Weisse, a surgeon and dermatologist, and formerly dean of the New York College of Dentistry, died in New York, June 25, in his seventy-third year. He was born in Watertown, Mass., and his city home was at 36 Gramercy Park. Doctor Weisse was a son of the late Dr. John A Weisse, and a direct descendant of Peter Faneuil, who gave Faneuil Hall to Boston. He was graduated from the Medical College of New York University, 1864, and a year later became lecturer in dermatology at that university.

Doctor Weisse was a former professor of surgical pathology at the New York College of Veterinary Surgeons and was one of the founders of the New York Dermatological Society and the New York Veterinary College. For more then fifty years he was professor of anatomy, surgical pathology and oral surgery at the New York College of Dentistry.

In 1886 he published "Practical Human Anatomy," which was the result of seven years' study and research. His widow survives him.

SOCIETY ANNOUNCEMENTS

The Panama Pacific Dental Congress

At the present time, matters relating to the Panama-Pacific Dental Congress are most encouraging. The attendance so far as can be judged by those who attended the meeting of the National Dental Association at Rochester, and the meeting of the New Jersey State Dental Society, will break all previous records. Everyone said he was coming, and the Committee of Organization wishes to assure all prospective members that they will be well cared for in every way.

Papers and clinics by some of the most noted members of the dental profession have already been contributed to the program. A large portion of the available exhibit space has been taken by manufacturers and dealers, and the success of this part of the Congress is positively assured.

The new Municipal Auditorium, in which the Congress will be held, is being rapidly completed, and will afford facilities for this Congress such as no other similar meeting has enjoyed. It is centrally located, and may be reached by numerous street car lines from the Exposition Grounds, or any hotel in San Francisco, in from five to twenty minutes.

The San Francisco Hotel Bureau, with offices in the Flannery Bldg., San Francisco, will look after the reservations for hotel accommodations for our guests. We earnestly advise all those who intend to attend the Congress to make their reservations early. Many Congresses will be held in San Francisco during the months of August and September, 1915, and many will be in session at the time of the meeting of the Panama-Pacific Dental Congress, and for obvious reasons the reservation of rooms should not be delayed.

Following is a circular letter from the San Francisco Hotel Bureau:

San Francisco Hotel Reservations for 1915—You can get all the rooms you want in San Francisco in 1915 and at reasonable rates.

By official tabulation there are 1328 hotels and rooming-houses, which, with 600 apartment-houses, represents a total of over 90,000 rooms with accommodations for over 200,000 guests at any one time. In process of construction there are over 150 hotels and apartment-houses that will be completed before the exposition opens, giving nearly 15,000 rooms more and in addition there are thousands of flats and rooms obtainable in private residences. Fully ninety-eight per cent. of these hotels and apartment-houses have been built within the last 6 years, so that all are modern and up-to-date.

With the purpose of making it as easy as possible for prospective visitors to secure any accommodations desired and at guaranteed rates, the San Francisco Hotel Association, representing more than 350 hotels, rooming and apartment-houses, has incorporated the San Francisco Hotel Bureau, with a capital of $100,000. This bureau will make contracts for hotel and other accommodations in any number required during the Exposition year, and it guarantees all its contracts. A San Francisco bank is its depository. These accommodations will be contracted at rates of from $1.00 to $3.00 a day, per person, European plan, and from $3.50 and up a person, per day, American plan.

Association of Military Dental Surgeons

The annual meeting of the Association of Military Dental Surgeons will be held at San Francisco, Sept. 1st and 2d.

WILLIAM C. FISCHER, *President*

MISCELLANY

AN EXPLANATION FROM REPRESENTATIVE GARVER

Millersburg, Ohio, June 12, 115.

EDITOR DENTAL SUMMARY:

Dear Sir—I thank you for your copy of your June number. In your article, "Legislation, the Result of Organization," on pages 508-9, you stated that I voted in the negative on April 8th. Just before Mr. Federman offered his amendment on that day, I made a short speech, calling attention to sections 1326 and 1327, and stating that the bill should not be passed without amending those sections. Mr. Federman's amendment did not correct this and I therefore voted against the bill. Mr. Enteman who sat beside me, did likewise. I afterwards prepared an amendment, amending said sections, and submitted it to Senator Lloyd. This was incorporated in the amendment offered by Mr. Federman on April 22d, and I then voted for the bill. In your next issue I wish you would explain why I voted against the bill on April 8th and, if your conscience so dictates, give me credit for calling attention to the conflicting sections and drafting the amendment.

For the truth of the above statements I refer you to Senator Lloyd and Mr. Federman.

Yours truly,

W. F. GARVER

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

WHAT SOCIETIES ARE DOING

Pennsylvania—State

Reading, Pa., June 23.—At the State convention of Pennsylvania dentists this afternoon a paper prepared by Dr. Harvey Wiley, former head of the Government Pure Food Department, on "The Practical Value of Mouth Hygiene," was read and discussed. These officers were elected: President, H. E. Friesell, Pittsburgh; vice-presidents, S. P. Cameron, Philadelphia, and C. S. Van Horn, Bloomsburg; recording secretary, L. M. Weaver, Philadelphia; corresponding secretary, George S. Schlegel, Reading; treasurer, W. A. Spencer, Carbondale.

The following were named on the various boards:

Censors, to serve three years—R. R. Hutchinson, O. J. Sprecker, J. C. Reed, F. Smith, G. J. De Long, H. D. Mitten, F. D. Miller, R. M. Cox, J. C. Hipple, and B. B. Sprout.

Examiners, to serve one year—A. H. Reynolds, F. B. Cooper, W. F. Fuderberg, F. H. McGill, Victor Cochran, S. B. Luckie, A. H. McKibben, and W. H. Fordham.

Dental Council, for one year—J. A. Standen, A. C. Barclay, W. H. Hain, W. B. Mansteller, F. A. Hogan, and A. P. Lee.

Tennessee—State

Nashville, Tenn., June 27.—Dr. W. G. Hutchinson, of Nashville, first vice-president of the Tennessee State Dental Association last year, was elected president for the ensuing year at the session of the forty-eighth annual convention. D. M. Cattell, of Memphis, was chosen first vice-president; C. Osborn Rhea, of Nashville, second vice-president; Eugene Campbell, of Jackson, corresponding secretary; James W. Winn, of Nashville, treasurer, and H. C. Maxey, of Memphis, recording secretary.

Knoxville was selected after some discussion as the meeting place for the 1916 convention.

The next meeting of the Maumee Valley Dental Society will be held at Napoleon, Ohio, October 19.

Wisconsin—State

Oconomowoc, Wis., July 14.—Officers elected at the forty-fifth annual meeting of the Wisconsin State Dental Association here today are: President, Otto G. Krause, Milwaukee; first vice-president, E. C. Oviatt, Columbus; second vice-president, P. J. Federspiel, Racine; secretary, T. L. Gilbertson, Milwaukee; treasurer, Adolph Gropper, Milwaukee; librarian, Roy Hopkinson, Milwaukee. Members elected to the executive council for three-year terms are: E. J. Harte, Madison; J. L. Malone, Superior; E. M. Kapelon, Manitowoc. A fish fry and entertainment were given this evening. The convention closes tomorrow.

South Dakota—Aberdeen District

Aberdeen, S. D., June 23.—At the meeting of the Aberdeen District Dental Society H. W. Thomas was appointed delegate to the state convention, with M. R. Hopkins as alternate delegate. The following officers were also elected: Thor Fossum, of Groton, president; A. W. Fossum, vice-president; M. R. Hopkins, secretary and treasurer.

Utah—Salt Lake

Salt Lake City, June 16.—The Salt Lake Dental Society held its annual meeting last night at the Commercial Club. Dr. J. Boyd Gorden was elected president; F. E. Christianson, first vice-president; W. A. Squires, second vice-president, and Hyrum Bergstrom, treasurer. A. S. Chapman was re-elected secretary. The local society will entertain delegates who pass through Salt Lake to San Francisco to attend the Panama Pacific Dental Congress. Dr. E. H. Evans was elected to the board of censors of the society, to succeed J. A. Denike, whose term expired this year. The other two members of the board are F. W. Meakin, whose term expires in 1916, and R. W. Hall, whose term expires in 1917.

other advantage." Emerson furnishes two definitions—one in which he defines "popular success" and the other he terms the "real or wholesome success," and in another place shows that success is attained when "the soul is appeased by seeing some correspondence between our wish and our possession."

In the last analysis, it would seem that success is in a large measure a condition of mind and if this conclusion does not justify the title it at least furnishes an excuse.

All times and all climes have furnished brilliant examples of men who have attempted success by the short route, and our prisons and penitentiaries are filled with those who have attempted a prosperous termination of their efforts by expedience alone.

It might be argued that the professional man was attempting success by the short-cut who seeks to serve an unusually large number of patrons or aims only to accumulate money, or attracts attention to his place of business by a spectacular display of equipment, or the exaction of exorbitant fees in the absence of unusual service. But it is our purpose to be more specific. The short-cuts called to your attention here must not be confused with the measure taken to eliminate waste of time, energy and material in producing a definite efficiency in our work, but has to do with the quick method adopted to produce a result that is, at best, but a substitute or an imitation of real accomplishment. Nor must it be assumed that we are addressing only those who fail to do conscientious work. For taken as a profession, we are all guilty of producing results somewhere in our work that fall far short of our best effort.

The dentist who is too busy to attend to the proper sterilization of instruments and field of operation in the simpler forms of surgical work in the oral cavity, such as extracting teeth, opening abscesses, producing local anesthesia by means of hypodermic injection, etc., is attempting the short-cut which not infrequently imposes a heavy penalty borne by both patient and operator, more especially the patient. The public is entitled to the same consideration at our hands as is shown by the conscientious surgeon who will tolerate nothing short of absolute protection against infection. In fact, we would do well to observe carefully the methods adopted by those who are doing successful work in conductive anesthesia. Note the pains taken in the preparation of instruments, anesthetic and the treatment of the field of operation.

The dentist who boasts of being able to produce from three to six artificial dentures per day is placing in the mouths of his patients that which in the main must reflect discredit on himself and the profession, and is attempting the short-cut with the prevailing result. It would seem if we are to attain our highest efficiency in this particular work, that in the large communities, at least, we must place it in fewer hands, demanding that those who attempt this work shall devote much time to special preparation in order that they may be able to give superior service to the many who are waiting anxiously to be supplied with an efficient substitute for lost teeth.

INLAYS

The making of gold inlays by means of a disappearing model and a flow of metal through the mold by pressure was originated by Doctor Taggart and brought to our attention about the year 1906. Among the many advantages claimed for the inlay was the great saving in time in large restorations over the malletted filling and the profession at once became intensely interested, as did also the manufacturers and soon thirty or more varieties of casting machines were on the market, all designed to carry us to success by the short route. Some of our more conservative operators ignored the inlay and held firmly to the type of dentistry that had given them satisfactory results in the past. Other operators, also conservative men, accepted the inlay and worked out a definite technic and were soon ready to show us its value, tell us where it could be used legitimately, and where it could not be used to the best advantage; and, further, taught us that it could not possibly be considered a time saver if we sought real accomplishment in our work. But in the meantime, we were busy inserting thousands upon thousands of these cast fillings and from the testimony now obtainable from the dentist himself, there seems no doubt that a very large percentage of this work, even such as has come from the hands of the capable and conscientious operator, has proven a menace to the mouth and a disappointment to dentist and patient alike. Irritation to the soft tissues through failure to produce smooth margins, destroyed interdental tissue by reason of not having restored marginal ridges and contact, malocclusion through failure to conform our inlays to the anatomy of the tooth on the occlusal surfaces, and the tendency to easy dislodgment from faulty cavity preparation, only partially indicate the penalties we are paying for having chosen the short-cut in this department of our work.

CROWNS AND BRIDGES

The department of Crown and Bridge Work has been a very popular and fertile field for the adherents of the short-cut. It has been relatively easy to interest the public in an operation that results in placing in the mouth of the patient a considerable mass of the precious metal either in the form of the shell crown or the more or less extensive bridge.

It would scarcely seem necessary to call attention to the immense amount of this destructive work that is daily being inserted by men who, apparently, have little or no conception of the havoc being wrought. The time consumed in constructing one of these banded crowns including the preparation of the root would average from thirty minutes to an hour. The loosened teeth resulting from bad occlusal restorations, the destruction of interdental tissue through failure to restore marginal ridges and contacts, pyorrhea from ill-fitting bands and a general condition of extreme uncleanliness, has been called to our attention so insistently during the past year or so that it would seem unnecessary to enlarge upon it at this time.

What seems to be giving quite serious concern to many now is the fact that much of our most conscientious and intelligent effort has proven a decided detriment to the carrying out of an efficient prophylaxis in the mouths where these banded crowns exist. It would seem that our present popular system of fitting bands must, to a great extent, be eliminated, and such root preparation adopted as will admit of the use of a swedged coping designed to restore the normal enamel line at the gingival, and so fitted as to offer no impediment to the future scaling and polishing of the root involved.

ROOT CANALS

In no branch of dentistry has the short-cut been more persistenty adhered to and the methods adopted so varied as in the treatment of pulpless teeth, and all in the effort to avoid that which to most dentists is an exceedingly tedious operation.

We cannot begin to enumerate the great variety of methods advocated by the enthusiasts of the short-cut or the endless number of remedies being urged upon the dentists through the extravagant claims of the manufacturers. It is enough to call attention to the fact that a surprisingly large percentage of the results of conscientious effort has proven unsatisfactory to the operator when he has had an opportunity to examine it with the assistance of the radiograph.

The work of Billings, Rosenow, Hartzell and many others, has shown us a great variety of systemic disturbances which may be traced to the presence of infection about the roots of devitalized teeth, and we are now receiving definite information to the effect that in many instances of lowered resistance in the individual, dead teeth which have been most carefully and scientifically treated and filled, have become the seat of serious trouble.

Now, if any considerable portion of our best work is to result so disastrously, what may we expect from the great mass of operations where the short-cut has been the rule?

Has the time not almost arrived when our root canal work must be checked up at various stages by means of the radiograph? And is the time far distant when the means for obtaining the radiographic film will be considered an essential in every modernly equipped office? The illustrated lecture by Doctor Best that is to follow should receive your closest attention.

PYORRHEA

No one who has kept pace with recent literature covering the subject of pyorrhea and the many methods used in the effort to effect a cure of this most prevalent of all mouth diseases can fail to be impressed with the great amount of interest being taken by both medical and dental men.

With a large number of scientific men carrying on a campaign of intelligent investigation, including clinical experiments on a broad scale, we cannot very well fail to obtain from their findings information of untold value to us and to our patients. However, is it not true that much of this literature has in effect invited the dentist to attempt the short-cut in the treatment of this disease?

It should be made clear to everyone who is interested in this subject either as patient or dentist, that pyorrhea is not cured by vaccines, tartar solvents, emetin, ethyl bromide spray, succinimide of mercury, pyorrhocide, faith cure, Christian science or osteopathy.

The dentist who relies on vaccine, emetin, or other medicinal agents for the cure of pyorrhea, in the absence of good instrumentation, will reap a harvest of disappointed patients. Used alone, the best that can be expected of any one of these agents is a temporary modification or elimination of one or more of the symptoms. The men who have given us the report of their clinical experiences in the use of the above agents have not laid claim to producing cure through medicinal agents alone, but have failed to place sufficient emphasis on rational surgical treatment and the impression has gone forth that all that is required is a good hypodermic outfit and a definite quantity of the desired remedy and the patient will be immediately placed on the road to health and happiness.

Hartzell has told us that vaccines have a value that should be used after other measures have failed. Billings has shown us how futile our attempts would be to cure chronic arthritis from autogenous vaccines derived from pyorrheal pockets, when the circulation to the affected parts is materially disturbed and has emphasized the fact that we must get an abundance of blood supply to the diseased areas before our vaccines can contribute much in the way of permanent relief.

It is not the aim of the writer to discourage the use of remedies that afford definite relief, but merely to give emphasis to the fact that permanent cures must not be expected until the pockets about the teeth involved have been rendered free from all deposit and every obstruction to the full functioning of the vital forces removed.

PREVENTIVE

No step in the way of definite progress in our modern civilization has so impressed the intelligent observer as that accomplished and being accomplished by the medical world in the elimination or reduction in the number of deaths due to preventable diseases. Any extended comment on this subject would be out of place even did time permit.

How much is the dental profession as a whole doing to prevent the mouth conditions that call for so much reparative work? Just how much are we as individual dentists doing to carry our young patients through to adult life with sound teeth and healthy mouths? Some year or so ago a specialist in the treatment of pyorrhea was asked by a dentist what he considered the cause of the disease. He replied promptly: "You men who are cleaning teeth for a dollar."

If you analyze this answer you will find that it contains quite a large measure of truth. Here is one phase in our work in which most all of us have been guilty of the short-cut method. "Cleaning teeth" suggests an operation which keeps us busy for the space of from twenty minutes to an hour, and we have visions of a fee ranging from fifty cents to $3.00, and it might be remarked that in many instances the money is well worth it!

If we are to do work that is to be constructive in a real sense, we must begin and begin *now* to practice preventive dentistry. We must bring about such conditions in the mouth as will permit of maintaining absolute cleanliness. And how are these conditions to be brought about? It is not within the province of this paper to deal with methods of procedure, but in view of the extreme importance of this subject we cannot very well resist the temptation to throw out some suggestions. If prophylaxis means anything, it means among many other things that we must examine carefully each surface of every tooth, explore the subgingival areas and pockets and with suitable instruments remove all forms of deposit and destroyed or partially destroyed tooth surface and these surfaces rendered smooth and given a high polish. When our work as outlined has embraced the entire mouth, we are ready for the final instructions to the patient concerning the daily care. This subject of daily care is one of sufficient importance to furnish a great deal more discussion than can be given at this time.

We can almost hear someone asking, "Who will be willing to pay for all this work?" To be sure, it is not everyone who wants or would appreciate this kind of attention. On the other hand, we might ask, "How many mouths have you cleaned up to your entire satisfaction and have had your fee refused?" Why not take a portion of the mouth, or the entire mouth if need be, and show the patient just what is meant by a clean mouth, why it is of inestimable benefit and how the conditions you have established may be maintained. How did that man sell you that touring car or runabout you are driving? By giving you a graphic description of it in your office? By no means; he took you to ride in it, impressed you with the especial features he felt you might be interested in. Later on, if these claims were fully substantiated by investigation on your part and the car suited you in other ways, you bought it.

Clean up a few mouths to the point where they meet with your full approval, take the necessary time and patience to teach the patient how and why these conditions should be maintained. Appeal to their respect for absolute cleanliness and to their vanity and love for the beautiful. Show them plainly how a clean mouth contributes in a definite way to build up the defenses of the body against disease. Don't become impatient if they fail during the first month or so to accomplish in the matter of daily care just what you had hoped. Show them just where they have failed and how the difficulties may be overcome. Show each patient that you have a personal interest in him and then see how many will refuse you your fee. You may be pleased to find some patients who will express surprise to think you have delayed so long this thorough and consistent treatment of the mouth. We could almost afford to clean up a few mouths if for nothing more than the moral effect it would have on the balance of our work.

Some of you in this audience are almost ready to say that "this is all very well, but it is distinctly a woman's job." Women are doing this work and very creditably, too, but where this is being done efficiently by women, their special training has been preceded by a three years' course in a dental college. If any of you here feel that the dental nurse, as described in the magazines, is the solution of our problem of prophylaxis, there is no doubt that with a little careful study you will soon be called upon to revise your opinion. There may be some features in this work that could be safely placed in the hands of a well trained assistant who may not have had the training incident to a college course, but there seems to be no logical argument that would justify us in legalizing those who have had but a few months' training to do instrumentation of any character on the living tissues about the teeth.

This would not seem to be the proper time for any extended comment on this subject, but it might not be out of place to suggest to those of you who are open to conviction that you prepare a few mouths so well that you are willing to submit them for inspection to any prophylaxis specialist and then decide just how much of the procedure you would be willing to entrust to those whose intelligence and training must, of necessity, be extremely limited.

It must not be inferred that any attempt is being made to minimize the importance of the woman assistant, but it certainly seems prudent that her efforts be confined to such work as calls for no intimate knowledge of anatomy and histology, and where error in judgment cannot possibly result in any physical injury to our patient.

Some of the beautiful work being produced today in the way of porcelain jacket crowns, inlays, both of gold and porcelain, bridge work, both fixed and removable, is being done very largely by women in the laboratory; and if we are fortunate enough to select as an assistant one who has some considerable ability in a mechanical way, it would seem that the variety of work she may do is only limited by our ability to teach.

But to return to our subject; what are we to do to reduce or eliminate our short-cuts? Someone has said that the efficiency of any community cannot rise higher than that of its average citizen. In like manner the efficiency of the dental profession cannot possibly rise higher than that of the average dentist; but how may the average efficiency in our profession be brought to a higher level? An incident brought to my attention a day or so ago will serve to show how one community was benefited in a definite way by increased dental efficiency. The story, which is duly vouched for, runs about as follows: Smith and Brown were the only dentists in a small town; intense rivalry had developed until the community was almost equally divided into two factions—the friends of Smith and the friends of Brown. It happened that on returning from a long trip these men found themselves the only occupants of a railway coach. They exchanged greetings with as much cordiality as they could muster, which was not much. It may be that they were traveling through territory that had not yet voted on local option, and that the crustiness that had existed for years was softened over a supply of apollinaris. Be that as it may, when they arrived home, they had become acquainted and in the weeks that followed, that acquaintance grew into friendship. They became more interested in their work and they soon learned that each had a hobby, or a branch of dentistry he was most interested in. They decided later that it was no longer necessary for each man to attempt all kinds of dentistry, and they decided to separate the different branches of their work, and each equipped himself to do his special feature exceptionally well. And this condition still obtains in that town.

Now just what occurred there to bring about these happy conditions? In the first place, they became better acquainted—became friends. In the second place, they became boosters and in the third place they specialized. Specialization is what has brought about the high efficiency that now exists in the field of medicine. It is plainly our duty then, first to become well acquainted with one another, then we must learn to boost and let us spell it B-o-o-s-t, not B-o-a-s-t. And lastly, let us not all try to do all branches of dentistry.

When these conditions are brought about we will be delivering to our patients more nearly the class of service to which our claim to being professional men automatically commits us.

DISCUSSION

Dr. Marcus L. Ward, Ann Arbor: I think that a good many have noticed that the dentistry of today is not the dentistry of a few years ago. The reason for it is that we have eliminated some of the short cuts that the essayist refers to and undertaken more thorough methods of practice.

Almost all of us, I believe, have found that it is seldom that fine work and little time go hand in hand. It seems that the essayist has had it recently brought to his mind in doing some special work in the treatment of pyorrhea. Possibly that is what prompted the paper. It would seem so from the fact that he refers more briefly to the subjects of inlays, crowns and bridges, etc., than to the work he has recently been doing. It makes little difference, however, for the subject always has been and probably will always be a very good one to go over once in a while.

The essayist has pointed out that the cast gold inlay, at the time of its introduction, was heralded as a short cut to something pretty good, but later it was found that it consumed much more time than was expected if made properly. He pointed out, too, that crown and bridge work was one of the most fertile fields for the short-cut methods. In these respects I agree with him fully. I am not certain, however, why he ventured the assertion that it is a proper time to abandon the popular method of fitting bands. I fail to get the connection between this assertion and the subject which is short-cut methods.

Inasmuch as I am associated with the subject of crown and bridge work, I feel that it is my duty to direct my remarks more especially towards the attempt of the essayist to condemn bands than towards the title of the paper. Within the last few years it has been my observation that most of those who are identified with the subjects of prophylaxis and the treatment of pyorrhea condemn the use of bands quite generally, and the essayist, after having been identified with the very best things in dental practice, dental laws, dental ideals, etc., has allowed himself to go on record apparently upon the opinion formed during a few weeks' stay with Doctor James, without having given the great army of crown and bridge workers in this country who are struggling for better things in their line of work, a chance to show him that the construction of the band rather than the band itself may prove to be the greater objection.

Goslee has said regarding the gold shell crown that, "Regardless of the progress and development of crown work in general, however, and irrespective of the esthetic and hygienic advantages of porcelain work, this style of crown is still, and probably always will be, one of the very best means and methods of subserving the requirements. Indeed, when their application is indicated, and when their adaptation and construction, by whatever method chosen, is practically and skillfully executed, no other one method of procedure seems to offer so great an opportunity for the serviceable and permanent reproduction of the normal condition."

While we must admit that recent methods of practice have taken the place of the gold shell crown to some extent, I believe that no one who does very much crown and bridge work is willing to have the shell crown eliminated because it involves a band. For about seven years the writer has made a close study of those who were most emphatic in condemning the band in all forms and the impression he has gained is that these persons were not familiar with recent methods of root preparation nor methods of crown construction. For about the same length of time there has been a continuous plea on the part of those practicing the most bridge work for better contours, and those who have put these better shaped crowns into practice are more firmly of the opinion than ever that it was the poorly shaped, and poorly adapted crown that constituted the principal objection. Even our best technicians have not been able with our present technic to construct crowns of the band type or any other type that came very near to the shapes of normal teeth. It has not always been because the operator had a tendency to adopt some of the short-cut method that the essayist mentions, but because the subjects of crown and bridge work is just beginning to get attention by some of our best students and technicians. It is less than two years that the orthodontists launched a campaign for better tooth forms and at once it was found that some new technic had to be developed.

It is not surprising to have one who is practicing prophylaxis and the treatment of pyorrhea condemn the use of bands in all forms because if there had not been trouble from the bands he might not have seen the case. Such condemnation is not sufficiently well based, in my opinion, to warrant the adoption of such practice by the great body of dentists assembled here, and to be more complete should involve an investigation of the percentage of bands that were giving trouble in the practice of a skillful crown and bridge worker. For the present it is better in my opinion to join the orthodontists in their campaign for better shaped tooth forms and the crown and bridge workers in their campaign for better root preparation and band adaptation, than to unconditionally condemn the use of bands.

Another feature was mentioned by the essayist that merits our attention, I believe. It was the subject of root canal work. There is probably no part of his paper that strikes more forcibly than his reference to short cuts in root canal work. With this reference, however, I believe it is a little the same as the one in regard to the use of the band. It is a little extreme. Radiographers are inclined to paint a poor picture of the work of the average dentist in root canals and almost invariably advocate as the correction the making of several radiographs to determine whether a good operation has been done and aid in doing one. The criticism that seems proper to make is that they do not urge better knowledge of root canal anatomy by the ordinary way of getting it than to rely almost entirely upon the radiograph. It is true that the radiograph reveals the defect but oftentimes if the short-cut methods that the essayist has discussed were substituted by more thorough ones there would be no need of the radiograph at all.

Dr. C. P. Wood, Detroit: I wish to commend Doctor Honey for the very excellent paper. He sets clearly before us the latest and most approved methods of preventive dentistry, just as though he really knew how to do it, and I believe he does, for I have just now come from Kalamazoo and find that he has one of the best equipped offices in the state and gives his patients the latest, highest-class dentistry. The latest is that he is in the Jesse James class in prophylaxis and pyorrhea treatment, having recently completed a course with Doctor James, of Chicago, and returned with the 150-shooter Carr-James-Hartzell set of instruments, from which I think none of his patients will escape, even with the skin of their teeth.

There is no field in which short-cuts are being practiced more than in pyorrhea treatment. It is a common thing to have patients come to me who have been previously treated by the short-cut methods, the use of emetine or vaccines, without having previously thoroughly removed all deposits, and in consequence they have no satisfactory results—the most filthy conditions still existing; whereas, if the dentist had gone to the bottom of those pockets and removed all deposits and dead membrane and polished the exposed root surfaces, success would have followed just as sure as day follows the night.

Dr. D. D. Smith's assertion that pyorrhea is a filth disease has never been successfully contradicted. We must remove the filth to get results. The writer has occasion to examine the mouths of patients from many dentists, and the average make this mistake of short-cut—doing just the one piece of work the patient thinks necessary instead of taking a general survey of the whole mouth, and showing him his real needs. In consequence, that mouth is never right; we should never fix one tooth only, without full consideration of that tooth's relation to the whole mouth. I hear someone say, "he is exaggerating." But it is the rule of patients coming to me to have mouths so unhealthy, incomplete, full of cavities, abscesses, malocclusions, irregularities from extractions, with no effort to fill vacancies, that any one patient would keep a dentist busy for a month or two if he only had the ability to do the work and salesmanship to make the patient see his need. The writer traveled for three or four years before entering dentistry, and had the bitter experience of many times selling a customer a $25.00 bill of goods, and going back on the next trip finding his competitor had sold him a complete line of $200 or $300 worth, thus putting him in position to compete with his neighbor.

A school teacher came to me recently, after trying for years to get some satisfactory results from pyorrhea. The last dentist told her he had done everything for her known to the profession. Upon examining, the first difficulty I found was four abscessed molars, which had gone so long in a putrescent condition as to be worthless. After spending fifteen sittings in scaling and polishing the balance of the teeth, treating some root canals, she paid me $150 for the completed work, and then went and had Doctor Bowles put in bridges to the amount of $300, and suffice it to say she is very much pleased. I hear someone say, "my patients can't afford it." I thought that merchant couldn't afford it, but I really did him an injustice to sell him a few goods for $25.00, which gave him no opportunity to really compete with his neighbor until the other fellow, who had more foresight than I, gave him a complete line for $300.

If we give our patients the most complete set of well-balanced teeth possible, after having previously convinced them of their need, most all of them have money to pay for what they want.

It is a common thing for me to find patients who have been regularly in the hands of good, up-to-date dentists, with from five to fifteen cavities. This should not be. We should work for no more patients than we can do the most thorough work for.

A multitude of the sins of omission are being covered by the profession saying to their patients with pyorrhetic abscessed teeth, "You have pyorrhea and will lose your teeth;" and then make no effort to remove deposits or cure up the abscessed roots. It has been common practice in years past to leave roots in an abscessed condition, thinking they would do no extended harm, but in the light of the most recent discoveries of serious systemic conditions being caused by diseased teeth, we think that any dentist who will knowingly leave an abscessed root in the mouth without making an honest effort to cure, and if it cannot be cured, to extract it, is too much a back number to practice dentistry.

The medical profession is looking to us to relieve the system of the above handicaps from bad mouth conditions, and we must wake up and show them that we can master the situation.

I do not believe a clean tooth will be pyorrhetic—other conditions such as occlusion, healthy pulp and proper anchorage being obtained. A large percentage of pyorrhea may be avoided by taking time to show patients how to care for their mouths and keep showing them again and again, until they can do it as well as the dentist. The writer frequently takes a whole sitting for the above and charges the same as for the regular treatments. A lady said to me recently, after I had spent a sitting on cleaning and treating the gums around a badly constructed bridge, "Why, doctor, that should be cleaned every day under that bridge." "Yes," I said, "but you cannot do it, because it is impossible for you to pass the floss under those dummies; you will be obliged to have a new bridge before you can care for it."

The idea for the past twenty years has been to put bands so high above the gum margin that no decay could possibly follow. I believe with Doctor Honey that too much of the crown and bridge work of the careless sort has been done, but would add that more of the right kind is needed. Many of the profession will still use bands, and if placed only as high as they can be perfectly fitted, I believe they will do no harm, and will be even better than a poorly fitted coping. It is the universal habit nowadays to use the all-porcelain dummy, and I would say that nothing causes more severe trouble to the gum tissue, if used in the average short-bite cases, for it is impossible to leave the proper interdental spaces or breathing place for the gum, next to the abutments, to allow for proper cleansing of the bridge.

The short-cut idea of extracting the first molar to get rid of trouble in young patients quickly, has caused more far-reaching trouble than any other one fault of the profession. And I think the time has come when such extraction is a thing of the past.

Bad root canal work in the past has been caused by the habit of the profession of not charging much for work which could not be seen by the patient—another case of poor salesmanship. We must explain every step of root canal work, make the patient understand the great importance of thoroughness, and we will have no trouble in collecting the same fee as for any other operation.

Doctor Honey's statement of the meaning of "prophylaxis" is very complete. I would add that it does not mean, as many seem to think, the going over the teeth in a hurried manner, with an orangewood stick, but it does mean particularizing with the mouth mirror, noting any irritation from whatever cause, overhanging edges of inlays, bands, cavities, or otherwise, and removing the same, one after another, until you have covered the whole mouth. This will get results. Many say to me, "I get tired of strictly prophylaxis treatments; it's too monotonous." If this is the case, we are doing just routine work, killing time, waiting for the whistle to blow—we are not particularizing enough. Don't do the work just because the patient pays you a good fee for it. Look for inflamed spots, remove the cause, show the patient how to keep that place clean; particularize all over that mouth and you will find it exceedingly interesting—something new every time the patient presents for regular treatment. Doctor James told me that he had rather treat pyorrhea cases and do general prophylaxis than to eat his dinner.

In general practice of preventive dentistry nine-tenths of the battle will be fought and won when we have made flush joints at the cervical of all crowns, inlays and fillings, preserved all interdental spaces, and established a well balanced bite—then the patient can very successfully care for his own mouth. If all this has not been done, the good Lord himself could not keep that mouth clean.

Don't put a bridge in the mouth under which the patient cannot pass the floss easily.

Don't try to cure pyorrhea piece-meal—treat the whole mouth or not at all.

Don't leave a suppurating tooth in the mouth which cannot be made healthy and kept clean; don't allow any spaces to remain between the teeth. Fasten every loose tooth to some other. Anchor all bridges so that there can be no lateral movement, even though you have to use a bar across from one side of the mouth to the other.

Doctor Honey says clean up a few mouths to your entire satisfaction. I say that no dentist with a full, regular practice, will have time to find out by his own effort what a really clean healthy mouth is, unless he eliminates all but a few patients who can and will spend time and money enough for your best efforts.

DR. F. H. ESSIG: The paper does not cover the majority of cases we have to meet every day, especially in the smaller towns. Ten per cent. of the cases might be able to meet this expense, but the other ninety per cent. are in a situation where they cannot receive this expert work. It has been sad in my practice to note the young people from eight to fourteen years of age who are unable to have their teeth regulated. Many cases of pyorrhea and poorly cared-for teeth are due to the irregular shape that the teeth are in. In order to straighten these teeth and get them in condition where they can cleanse themselves and keep themselves in good condition, the teeth must be regulated. The people are unable to stand the expense necessary to this, and the majority of dentists in small towns are unable to do this work. It seems to me the preventive part of dentistry should be in education along the line of oral hygiene, in school work and in the societies, that the child should be taught preventive treatment, and to preserve as many teeth as possible. It may be that a dentist can work an hour or two in some places and get $5 or $6, but in my practice the majority are unable to pay this. I have several cases right now that I have recommended to go to an orthodontist, and have offered to go with them, but their parents are too poor to have this work done.

DOCTOR PAGELSON: Perhaps in the smaller towns the dentists might reach the other ninety per cent. of those patients by educating them. There isn't one dentist in a thousand who educates his patient as he works on him. They don't think of telling their patients their teeth are not clean; they may tell them they ought to be clean. If, while they are working, they would educate the patient as to the method of keeping those teeth clean, it would prevent more than fifty per cent. of the pyorrhea now prevalent in the country.

DOCTOR HONEY (closing): If Doctor Wood had understood what I perhaps did not succeed very well in conveying, he probably would not have taken so much of his time in discussing the matter of the band and coping, because I am in absolute accord with what he has said. I spent three weeks in Chicago in Doctor James' office, and had an opportunity to see scores of cases, extensive removable bridges; and the copings on all of those roots were beautifully fitted, and they were the coping that Doctor Wood has spoken of, that does not eliminate the band principle; it is a band, the coping swaged from an amalgam model; it is essentially a band, such as Doctor Wood has described.

It is necessary in a great many cases to place a full gold crown on a molar or bicuspid, we will say. Now, I maintain it is not necessary to eliminate that full gold crown, but it is necessary to modify your method of making it, and the crown in a mouth where there is a tendency to pyorrhea should not be band-fitted in the ordinary way. Cut your tooth as though you were preparing for porcelain jacket crown, and fit an iridium platinum band and cap to fit, and wax that up and cast it, and you have no shoulder on your cast crown and it fits as beautifully as if it were a porcelain jacket crown, and you have furnished no impediment to the future scaling of that root.

Relative to the X-ray, I couldn't help but observe during the weeks I was in that office that the root canal was nearly all rayed. There was plenty of help, it didn't take very much of the time of the operator; in fact, the operator rarely spent more than five or six minutes with it, and in twelve minutes at the outside he had the ray there to examine with his steel probe in the root to determine whether he was ready to fill it, or must go still further. I am not ready to recede from my opinion as to that. I am not using the X-ray, but it is not because I do not believe in it, and I am sure I shall use it. It doesn't involve heavy expense. We could eliminate some of the useless expensive apparatus in our offices and replace it with an X-ray. I would be willing to accept the criticism if Doctor Wood will agree to put in his office an X-ray machine and use it consistently for six months, and then abandon it; I would be willing then to recede from my position.

HIGH PRESSURE ANESTHESIA FOR CAVITY PREPARATION AND PULP REMOVAL*

BY W. T. JACKMAN, D.D.S., CLEVELAND, OHIO.

DOWN THROUGH THE YEARS, ever since the beginning of dentistry, the prayer of both the profession and laity has been for some power, some method, some *modus operandi*, whereby dental operative procedure might be made painless, or at least less painful. This power was discovered, with its technical application, more than eleven years ago—positive, definite, sure. But alas and alack! because some patience, perseverance and tact are required to master the technic, for practical results, the rank and file of the dental profession has elected to go on in the same old way, thus saying in effect, "If they want me to operate on their teeth they must bear the necessary pain." That word "necessary" used in this connection should be forever stricken from the vocabulary of every dentist the whole world over. For to wantonly inflict the tortures of the damned on a fellow mortal before he has reached the realms of his Satanic Majesty is not, to say the least, humanitarian dentistry. To run a bur into sensitive dentin is a wanton thing to do, wholly inexcusable and without warrant.

After these many years of most satisfactory results with the high pressure syringe the writer feels fully justified in making the above statements. My fellow practitioner, the one who is not here but who will read this, are you traveling in the same rut you were fifteen, twenty or twenty-five years ago? If so, call for a ladder and climb up and out into God's sunshine. Why, man, the automobile, the aeroplane and high-pressure anesthesia have been discovered and made practical since then! If you do not come up and out, the condemnation of the Almighty should rest upon you and His infinite mercy and compassion upon your victims.

Now, my friends, inasmuch as the writer hasn't the least desire to hurt anyone he will proceed to tell you how he doesn't. About thirty-five years ago the cocain alkaloid was first marketed. The writer well remembers paying one dollar a grain for what was not as good as that which can be purchased now for about a cent a grain. What a blessing it is to humanity when rightly used—one of God's choicest gifts to man!

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*Read before the Northern Indiana Dental Society, 1914.

Many years ago Indians instead of pack horses were employed to carry loads across the Andes mountains in South America. It was noticed by travelers that these fellows though not large were able to carry enormous loads. It was also noticed that they were constantly chewing coca leaves which are found in abundance in that part of the world, (Peruvian Vuca), a shrub (erythroxylin coca). These leaves resemble tea leaves in size, shape and odor, and are a powerful nerve stimulant and while chewing these leaves they had, temporarily, the strength of giants. This led chemists to extract from the coca leaves that which seemed to give superhuman strength to those fellows and called it cocain. Cocain, then, is primarily a powerful nerve stimulant and its second effect is a still more powerful sedative. The sedative effect is, of course, the one we want for obtunding purposes. Now, please bear in mind the dual effect of cocain as we proceed to use the syringe with a two per cent. aqueous solution. We should use sufficient amount only of the solution to carry the effect just beyond the primary stage and just within the secondary or sedative; to push it further may injure the pulp by mechanical means; for you will recall that the pulp chamber is already full, so that if you force more into the pulp than it can absorb, it acts mechanically and will strangle it. Like all other drugs, when given in overdose it becomes harmful. If you will follow closely the description of the use of the syringe you will see how the solution may be used without overdose.

Let me say first, that next to receiving first-class operations, there is nothing that fills the heart of the patient with so much gratitude as to have had those operations made painlessly. Painlessly! Yes, for when the gum is cocainized for the adjustment of the dam and the pulp is put to sleep for cavity preparation, you have removed every part of the operation worthy the name of pain. How restful, too, to the operator! for there is no occasion for the patient to draw upon his sympathy.

In my practice at least ninety-nine per cent. of the teeth are sensitive, and a very large part of these are hypersensitive. So you see it becomes necessary to use high-pressure in nearly every operation. I always seek to completely desensitize the pulp for two reasons; first, that I may not hurt the patient, and second, that there may be no shock to the pulp from condensing the gold.

By way of illustrating the use of the high-pressure syringe let us select any tooth with gingival cavity—the most sensitive, probably, of all. Let this particular tooth be, if you please, an upper left first molar. Let us suppose the patient to be a miss of fourteen summers. The first thing to do is to assure her that she will not be hurt; then proceed to keep your promise by first having the assistant obtund the gum margin with a three per cent. aqueous solution of cocain; this she does by using a tightly rolled pledget of cotton about the size of a pea; this she picks up with the pliers, dips it into the solution, and then with gentle pressure applies it to the gingiva for several minutes. When well obtunded, apply the rubber dam in the usual way. If, however, the solution is cold, it should be warmed by passing the saturated pledget quickly through the flame of an alcohol or gas lamp. After the dam is adjusted, use a No. 3 round bur in a true-running hand piece in the most available place; other things being equal, just outside the cavity proper—*never* within the cavity. The cocain solution must be forced through *healthy* dentin to the pulp. If the syringe is used in the cavity of decay where the dentinal tubuli are clogged, the chances are the solution will not be forced through, but if forced through, the debris will also be forced through, which will infect the pulp and probably cause a severe pulpitis and a little later its death.

Use the No. 3 round bur and cut about one-third of the way through the enamel; then use a No. ½ round bur in the center of the pit made by the No. 3 and cut through another third of the enamel, when the pit is ready for the syringe. The point of the syringe should fit the pit, the pit made by the No. ½ round bur. Now fill the syringe by placing the point in the solution, open the handles and the instrument is ready for use. Grip it dagger fashion, place the point in the pit, press gently and close on the handles. If the contact is perfect, the handles cannot be closed. If perfect contact is had, then brace the tooth by counter pressure with the index finger of the left hand, close as tightly as possible on the handles for about thirty seconds, when the solution will have been forced through the cement substance between the enamel rods slightly into the dentin. Now use the No. ½ bur and cut through the other third of the enamel and slightly into the dentin. Up to this point no pain has been given the patient, for you will remember there is no sensation in the enamel, and as the cocain has entered slightly into the dentin, no pain was given when entering the dentin with the No. ½ round bur. If difficulty is had in making contact, lay a few fibers of cotton over the pit and the difficulty will be overcome; these fibers do not interfere with the action of the syringe because the force extended by it is so great.

We are now ready to do business, but doing this requires caution, for, remember, we want to force the minutest part only of a drop into the pulp. This can be done scientifically by counting, inaudibly, a second to a count; this can be learned with a little practice by standing before a regulator in a jeweler's shop.

The age of the patient must always be taken into consideration, indeed this is *the* guide that the syringe be not used too long—the younger the patient, the shorter the time. As you know, the younger the patient, the larger the dentinal tubuli. The patient referred to would, with perfect contact, require about seventy-five counts to obtund the pulp. Remember, one does not always get perfect contact, but just in proportion as perfect contact is approximated, in that degree the desired results are being obtained.

The high-pressure syringe, when properly used, is one of the greatest conceivable blessings to humanity, but when improperly or carelessly used may be an engine of destruction; therefore, it must be used intelligently, for no haphazard way will do. Using it the latter way is what caused so many to fail. The pit made in the healthy part of the tooth must be taken into the cavity proper in the final preparation; but leave the pit until the last for sometimes the anesthesia is not deep enough to last through the entire preparation, and when this is so a few more seconds' use of the syringe will again completely obtund.

Now, my friends, in a short paper like this the explanation of the use of the high-pressure syringe must of necessity be somewhat general, but the clinic will be a practical demonstration of the paper, which will be of much more value to you than the essay itself. Here let me assure you if you become master of this little instrument it will bring to you unending satisfaction and infinite joy to your patients.

DISCUSSION

Dr. W. R. Meeker: Personally, and in the name of the Northern Indiana Dental Society, I want to thank Doctor Jackman for this excellent paper. As the doctor says. "Down through the years, ever since the beginning of dentistry, we have been looking for some method of making our operations painless or at least less painful." There is, perhaps, no single subject that has taken the time and space of our dental conventions and dental literature as the desensitizing of dentin. I well remember when Doctor Custer lectured and demonstrated his cataphoresis apparatus at the dental college when I was a student, and only last year our state association gave one-third of its time to "Humanitarian Dentistry." High-pressure anesthesia and N_2O and O have been with us for several years; conductive anesthesia and desensitizing paste have just entered the field.

Doctor Jackman has done much in the last few years to bring to the attention of the dental profession the advantages of high-pressure anesthesia. An article appearing in the August number of The Dental Summary, by Doctor Walker, of Grafton, W. Va., will tell Doctor Jackman that his work has not been in vain.

Why Doctor Van Kirk selected me to discuss this paper I do not know, unless he knew that I knew very little about high-pressure anesthesia and wanted some such person on the discussion. From this standpoint I have handed Doctor Jackman some questions that come to one who is not personally acquainted with high-pressure anesthesia, which I hope will be of interest to others here.*

Doctor Sexton, in an article, "A Consideration of Painless Fads," says: "And after cataphoresis came the high-pressure syringe with its crop of dead pulps." In this article Doctor Sexton not only condemns high-pressure anesthesia, but all other humanitarian methods. As for me, I want to take the stand for anesthesia, analgesia, desensitized dentin or whatever name it may go under. Each one no doubt has its place and with a little common sense, tact and skill on the part of the dentist, we can "fill the hearts of our patients with gratitude," as Doctor Jackman says, and have that satisfaction that comes to one of having done our fellowman a real service.

Dr. J. W. Stage: I do not like to pass the opportunity of thanking Doctor Jackman for his most excellent paper. It is certainly interesting and timely. I have had some experience in the use of devices similar to this, while not this same make, with varying degrees of success. I found one phase of technic that was of more benefit to me than any other in using this instrument, which Doctor Jackman has not mentioned, and I simply wanted to give that for what it is worth. That is, take those inaccessible cavities, for instance a little cavity, not a large one, on, say, the second molar. It would be a very hard proposition to make that pit near enough to the cavity to include it in the cavity when you go to fill the tooth. I find that there isn't a tooth in the mouth but may be reached in a direct line by making the pit on some other part of the tooth than where the cavity lies. For instance, with a second molar you can approach it on the mesio-lingual side, and get a direct line into it by crossing over the tongue, over the roof of the mouth, and forming that pit, desensitize the gum tissue and lift back the free margin of the gum, and make the pit just at the junction of the enamel and the cementum of the root, and you will find a more fibrous tissue there than there is in the enamel, and a tissue that the point of the syringe will bore into and form better contact than you can in the resistive structure of the enamel.

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*Dr. Jackman does not go into detail.

In my experience with it, I find that the greatest objection in using this form was the difficulty in getting sufficient contact not to allow some leakage, and when you allow leakage you are not getting results. I found in going into the tooth structure at that point that you get more rapid results from the injection of this preparation, and you will have less trouble in getting contact, particularly in those inaccessible cavities that are hard to reach. After you have deadened the tooth, go ahead and repair your cavity, fill it in any manner you wish to fill it, and take a small amount of amalgam and fill that pit, and the gum tissue will cover it up. Just go far enough under the free margin of the gum so that when that goes back into place it will cover it up. You do not have an unsightly speck there. It is covered with gum tissue, and I have found that useful in my practice.

Dr. O. A. Van Kirk: We all know that pain is the only fear of the dental office. If a child has heard its parents or anyone tell of the pains they have suffered in the dental chair, it is often difficult to get the child in the office, let alone the dental chair. This fear of pain is prevalent not only with the youngsters but the older ones as well. The most of us dread to get work done with the same fear that our patients do. Physicians as a class are as hard to work for as any one. Still, they are equal to us in administering pain. The elimination of pain is the main thing to increase our practice. It is considered that one person in seven get their teeth cared for. If pain were eliminated the percentage that care for their teeth would be very much greater. Last December I saw Doctor Jackman give his clinic at Toledo before the Ohio State Convention. After taking out live nerves and cutting into sensitive cavities the patient would tell us, "There was no pain whatever." This interested me very much. I thought if we could get Doctor Jackman to give a paper and clinic before our society and if he could interest one dentist in his method, he would be worthy of his mission here.

Doctor Jackman (closing): With reference to working with children, I recall a case of a girl about 12 years of age. She came to my office with fear and trembling. I made an appointment with her and I said when she came, "I am not going to hurt you at all." She had large cavities, especially in the first molars, all four were badly decayed, and the second molars were defective and decayed in the occlusal grooves. That child came with her mother the first time. They came five miles across the city and had to change cars in coming. I made the first operation and she went away delighted. She was in the chair an hour and a half. She wasn't hurt, but was somewhat tired. I have made six or seven operations for her since, and she comes now every time by herself. She is greatly pleased. They raise flowers in their back yard, and she brings me a bouquet every time she comes. She has no fear whatever. She complained a little of being tired from sitting, but I do not hesitate to keep a child, when I do not hurt it, in the chair an hour and a half. I do not think I injure it. Many of you would make inlays for those teeth, but I make the old-fashioned gold or tinfoil filling, generally.

Take the first molar — oftentimes children will come with apparently a small cavity occlusally, but often times we find the dentin is softened almost to the pulp. You cannot use high pressure occlusally. I do not hesitate to make a little pit near the buccal margin, a place where the cheek will keep it clean, a very small pit like a pin head, and I go in in that direction—I do not care whether it is the first, second or third molar—and desensitize the pulp, and then I go in from above and prepare the cavity and fill that pit afterward, and do it without hurting my patients. If Doctor Walters does better with his method, that is the one he should use. Take the compound distal cavities in the second and third molars, if they do not extend too far forward; I want to anchor my filling at the occlusal end of that tooth, therefore I make my initial pit on the occlusal surface of that tooth, anterior to the cavity, cut out the grooves of the tooth and carry my filling forward to anchor it. Use whichever method you can succeed with best. In the preparation of the cavity, this little girl referred to sits quietly and seems to enjoy the operation.

Doctor Meeker asks: 1. "Do you use high-pressure anesthesia without informing your patient of it?" Never. The first thing I do is to show my patient this syringe and say, "This is a formidable looking instrument, but I won't hurt you when I am using it, and won't hurt you when I am using the engine in preparing the cavity." I have reached a point, and I can with a little practice and care, assure my patient I won't hurt him, and then I demonstrate the truth of that statement.

2. "To what depth do you go in dentin with the one-half round bur?" After you force cocain through the last one-third of the enamel into the dentin, the bur should pass through into the dentin about the diameter of the bur. If you go deep into the dentin, you can't get good contact. The instrument has a long handle, and if you insert the point deep into the dentin, and wiggle the handle a little, the solution will get out. Just get into the dentin; that is all you want, and then you can force it through the dental tubuli to the pulp.

A MEMBER: Do you keep your needle sharp?

DOCTOR JACKMAN: Yes, I bevel it with a little sandpaper. I have a little instrument I can bevel it with, but that is not necessary. If you desire, lay a few fibers of cotton right over the pit, which will give you good contact. Doctor Myers made three sizes of these instruments. He made a short one, which was difficult to handle, and then he made another longer one, and then he made this one.

3. "Is high-power anesthesia O. K. for pulp removal?"

Yes; I do not tell my patients when I am going to remove a pulp. I simply use the instrument about twice as long as I would to prepare a cavity; then I take the engine and open into the pulp chamber, remove the pulp with a broach; then I show the patient what I have done. You can do that in from three to five minutes. We used to use arsenic and you know how long that took. Some of you know Doctor Walker, of West Virginia. I was down there some years ago and gave a clinic before the West Virginia Dental Society, and Doctor Walker became so interested in the procedure that he has been preaching high-pressure anesthesia all over the state ever since.

Doctor Meeker spoke of some gentleman condemning high-pressure anesthesia because of the crop of dead pulps after using it. You know the neurologist uses strychnine; that is his chief anchor; that is about the only thing he has to give. If he gives a grain as a dose he will kill his patient. But 1-120 of a grain is supposed to be a nerve tonic—a proper dose. If a man is foolish enough to use the instrument like the late Doctor Cook did, he makes a tremendous mistake. It was new and he used it so long (thirteen minutes) on a little girl that he nearly killed her. If you get good contact, use it for thirty counts or seconds, and then test the cavity to see if it is sensitive. Make your notations with different patients, from the youngest child up to aged persons. The older a person, of course, the smaller the dental tubuli, and the more difficult it is to obtund. I have found but twelve or fifteen cases where I could not succeed with this instrument, and those were cases of curly dentine. A surgeon brought his little girl to me. I tried for an hour to obtund the lower left first molar, but did not succeed. There was no enamel on the tooth, therefore it was necessary to cap it. I couldn't find a place where I could force the solution through. The child grew tired; she came again and in two minutes I had the pulp desensitized. I had to cap four molars; the others I had no trouble with. I am satisfied that the first tooth had curly dentine. I probably killed some pulps when I was first learning to use this, but with the average deep mesial or distal or M.O.D. cavity, the chances are that in nineteen of twenty cases the pulp is already infected, although it may have given no trouble. We are not justified in taking that pulp out if it has given no trouble. Therefore, I try to save it, but the chances are most of them die. High-pressure anesthesia gets the blame for it. It is an instrument that must be used carefully, and if you use it carefully success is yours.

4. "Does rapid application of pressure or too long application produce pain?" That is a good question. Yes; occasionally too rapid closure of the handles will produce momentary pain; let up on the pressure somewhat and the pain is gone. The long continued pressure is controlled the same way.

5. "How proceed with abraded teeth?" I do not quite understand that.

Doctor Meeker: So often we find the molars where the enamel is gone from the force of mastication.

Doctor Jackman: You mean on the occlusal end?

Doctor Meeker: Yes.

Doctor Jackman: I make my pit on the buccal side—a new cavity if necessary—so that I may not hurt the patient. It is very difficult to force the solution through an abraded or eroded surface.

Doctor Meeker: About what amount do you force into the tooth?

Doctor Jackman: The minutest part of a drop. Follow the directions carefully as given in the paper and you will not overuse. I have had no ill effects constitutionally, and I use it on practically every patient. I may possibly have destroyed some pulps; but suppose I have. I have saved the patient pain, and the death of an occasional pulp is a very small matter compared with constantly hurting your patients.

Doctor Meeker: Why do they use a syringe large enough to give an overdose of cocain? Why couldn't the syringe be made smaller?

Dr. Jackman: You cannot do that because there is always more or less leakage. It leaks if you move the handles a little to one side. Also if you do not have perfect contact; suppose the patient moves a little or your hand moves, the solution will squirt across the room. There is an immense leverage. I sometimes fill the syringe a half dozen times in a difficult case. I seldom get absolute contact. If I have pretty nearly perfect contact, and a little leaks out now and then, I change the angle of the instrument to better the contact. We, of course, lose the most of our solution. Cocain is cheap and we use such a weak solution, that the cost becomes a mere bagatelle.

Doctor Gillis: What effect will the pulp stones and secondary dentin have on the administration of it?

Doctor Jackman: If there is congestion enough in the pulp to shut off the circulation, you cannot get results. You must depend on the circulation of the pulp. A highly congested pulp is difficult to obtund, and it takes quite a while to do it.

A Member: What is the duration of this anesthesia?

Doctor Jackman: That depends on the depth of it. Sometimes sensation will return before the preparation of the cavity is completed. If so, use the obtunder a few seconds longer, as per paper. The thought is to keep the pulp completely anesthetized, so as to prevent shock. Nearly all my operations are made with tin and gold, using the hand mallet. I make but few gold inlays,

FAITH AND FEAR*

BY ROBERT R. GILLIS, D.D.S., HAMMOND, INDIANA

IF WE WERE TO ASK the members of this audience what, in their experience in practice, they have found to be the greatest obstacle in attaining success, I am sure that all the answers would simmer down to the one word, *Fear.*

This fear is usually exhibited by the person in your operating chair; but not infrequently it is fear at the other end of the instrument that is the element which prevents the attainment of success in our efforts.

Fear! Fear!! Fear!!! As humans, we meet it every day and, as dentists, we come in closer contact with it than most any other line of professional workers do. And the only effective weapon with which to fight fear is *faith.*

Hence, it is my purpose now to consider in this paper the relation these elements or forces bear to the practice of dentistry.

By the words faith and fear we mean several things other than just the single idea that your mind may picture when I speak the words. Both have a lot of cousins, and I mean to include the whole family of either when I mention its name.

By *fear* we also mean worry, pessimism, grief, anxiety, despondency, anger, hatred, vacillation.

By *faith* we mean optimism, confidence, cheerfulness, courage, assurance, hopefulness, determination.

Each means a mode of life and tendency of thought. Faith is the natural, normal life; the life of health that God intends for all of us. Fear is the abnormal, diseased life; the life that results from transgressions of nature's laws.

Faith and fear play a mighty role on the great stage of life and from the cradle to the grave; yes, even preceding the cradle days and succeeding the grave's night, these powers are ever present, always influencing us for weal or woe.

The study of psychology teaches us how powerful is the influence of the mind over all our bodily actions and functions, and a combined study of psychology and physiology shows plainly that if only fear could be eliminated, the human race would be benefited more than any of us could imagine. While faith is beneficial like the dew and the rain and the sunshine to a growing plant, fear is a blighting agency; it blasts and kills as surely as mildews and frosts.

Fear, as experienced by the patient, results in delays that are ruinous to health and costly in every way.

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*President's address Northern Indiana Dental Society, 1914

Few are the patients who come to your office without expressing their apprehension at the ordeal they imagine they are to endure. Their remarks are trite; we hear them so often that they grow tiresome even to the point of being funny. And if this were the end of it, simply their remarks, it would not be so bad, we could endure it (as we must anyhow) and forgive. But fear does not end there. It persists and plays havoc. It has poisoned our patient's mind and so perverted his bodily functions that all our efforts need to be doubled, yea, trebled oftentimes, to attain our desired results.

Contrast this with the picture of a patient presenting in whose mind faith is the controlling power. This person is optimistic and confident. Everything you propose or attempt is received with assurance and the work is accomplished with dispatch.

As previously indicated, fear sometimes lays hold of the operator as well and fastens upon him a grip of doubt and vacillation that is disastrous to the successful termination of his efforts.

Fear in the operator's mind breeds even worse results than when it is found only in the patient's mind, for the operator's fear is so contagious that it may usurp the power of the patient's faith-thought and set up instead a despotic reign of fear-thought.

The uplift and exaltation experienced when faith rules supreme and, on the other hand, the despondency and weakness of mind and body through the evil influence of fear-thought has been recognized by all races of men. The Bible and all ancient literature is full of references to the distress caused by fear and to the glorification and praises of those souls possessed by faith and peace.

Never has there been a great warrior who did not recognize the full value of faith, courage, determination, in his soldiers; never has there been a great statesman who lost sight of the psychological effect of faith and fear upon his associates and constituents.

All and every form of curative methods, from the earliest of the savage tribes to the last word amongst modern scientific men, recognize that disease is cast out of the human mind and body only when an agent is employed that is capable of driving out fear-thought and enthroning in its stead faith. The whole category of curative agents ever known to man—medicine-men, idol-worship and sacrifices, charms, astrology, pagan superstitions, holy shrines, hypnotism, suggestion, mental telepathy, Christian Science, drugs, magnetic-healing, nominal praying--all and every one succeed only as they generate faith and destroy fear.

Horace Fletcher considers fear-thought one of the seven great evils and places it in the same category with alcoholic beverages and narcotic habits as health destroyers; and the cultivation of faith-thought absolutely essential to well being.

Doctor Osler says: "Despondency or lack of faith will often sink the stoutest constitution almost to death's door. Faith will enable a spoonful of water or a bread pill to do almost miracles of healing. The basis of the entire profession of medicine is faith—in the doctor, his drugs and his methods."

In this connection, then, one general rule may be established: "Faith is a health producer; fear is a disease producer." Thus it is put by Doctor Sadler, who is recognized as an authority on this subject.

It is not necessary for me to tell you dentists that fear is laying a great load upon you. It is demonstrated every day. What we wish to know is how we can relieve ourselves of this burden. Some there may be who would argue that pain is the greatest bugaboo with which our profession has to deal. I do not agree with such argument and am sure that ample proof of the error of such argument may be found in almost any case wherein the pain can be relieved or removed, yet fear remains.

Some people are much greater slaves to fear than others, and just in degree as worry and doubt possess their mind are they hard patients to handle. Some have fear inculcated by pain; many, unfortunately, are fearful and trembling only because of hearsay, unkind friends having poisoned their minds previous to their dental visit with stories of agony and torture.

This latter class may be cured and faith-thought established in their minds in a comparatively short time; but with those persons who have suffered long, we have a different and more difficult problem.

All our nerves are paths over which travel the various impulses and sensations. When a given impulse travels a path repeatedly it wears a groove, so to speak, and, if that impulse be one of pain, the nerve terminal, trunk and center may become so worn and accustomed to the oft repeated message of pain that either part of the system may ultimately send out false messages which result in just as severe suffering as was caused by the original disturbance. These afflicted parts of the nervous system become diseased, actually, and this abnormality results sooner or later in pathological changes in the parts that co-operate with them. So, little by little, the patient's whole system becomes deranged and he is ultimately the victim of many imaginary ills in addition to the real original disturbance.

It is possible for pain to so demoralize the functions and operation of the nervous system, setting up fear in the mind, that all mental interpretations of physical impressions are wholly unreliable. When this process goes on to a sufficient degree, we send the unfortunate victim to Longcliffe at Logansport. I frequently think that some patients who present for dental service are surely fit candidates for this journey.

Having recognized the evil accompanying fear-thought and the desirability of replacing it with faith-thought, how are we to bring about this change? What methods may we employ that will dispel the clouds of fear and let in the sunshine of faith? The solution of this problem means success to the practitioner of dentistry.

Most of us—all of us—are contending with this monster, Fear, and just in proportion as we fight him into the background, just in proportion as we are able to establish faith and confidence in our patients' minds, are we successful dentists.

There are numerous methods of accomplishing the desired end. We all employ some of them. And all of us could be still more successful if we would but study this problem more and find new answers. We may legitimately use anything and everything that is based upon truth and fact and that does not injure the patient.

As to ourselves, we should present an appearance that commands respect and confidence; our speech should be such as to generate faith that we possess a knowledge and ability commensurate with our calling; our manner toward our patient must be kindly, but not sympathetic to the point of weakness; our explanations of the work to be done and methods to be used need not be in detail, but only such as will inform the patient that we have system and definite purposes in each operation; our side-talk (that is, our conversation on other subjects than dentistry) should be along lines of thought that are of interest to the patient and agreeable to his beliefs—ride his hobby, if you know what his hobby is.

As to your office, have every feature of it the best you can buy; let every piece of furniture have character, let its appearance bespeak high quality; be sure that the decorations and furnishings harmonize and blend into an artistic, pleasing whole. You cannot have your rooms too well appointed for anybody who would make you a desirable patient. You will be surprised how much apparently indifferent people will notice and appreciate the little refinements that you would ordinarily suppose might "go clear over their heads," as we say.

None of your patients (and you, least of all) would care to revert to the old office when once you have brought your equipment and furnishings up to the latest standards. In fitting up the new office, follow the advice of Polonius to his son, "Costly thy raiment as thy purse can buy;" and I would add, "and then some," for mighty soon you will find that "thy purse can buy" more than it ever did previously in the old surroundings. Above all things, arrange your reception room (and operating room too, as far as possible) so there will be nothing to remind your patients of a dental office. Put up a few fine pictures in place of the diplomas and certificates displaying blue ribbons and golden seals. The pictures will prove far more entertaining and worthy of attention.

As to the assistant (and every dentist should have an assistant) let all we said of ourselves apply to her. Her presence alone is something that inspires confidence and, when she "knows the business," her assisting in operations places your service upon a higher plane of desirability. Your manner toward her and hers toward you must always be respectful and such as would lend dignity to the place.

As to your methods, employ the latest that have proven worthy and sufficient. Don't be ten years behind the times. New equipment and appliances cost money but when you learn that your friends in the profession are succeeding with some new method, don't hesitate to invest a little money. Of late years we have had numerous preparations and appliances offered that enable us to alleviate pain. The common aim of all is thereby to eliminate fear.

You all know that if a patient could but see the field of operation and know absolutely what was coming next his nerve tension would be relieved ninety per cent. It is not pain itself, but fear of pain, that must be overcome.

So I say use anything and everything that the case in hand requires. And do not limit yourself to any one agent or method. There is no one panacea for all this trouble. Local applications, hypodermic injections, nitrous oxid-oxygen, all have their places and with all of them a generous amount of mental suggestion.

Many operators are inclined to think, "Pooh! Bah!" when suggestion is mentioned, but such men have not studied the question or else do not realize to what extent they actually employ suggestion. By suggestion I do not mean a running-fire of chatter and talk to occupy the patient's thoughts continually. That is needless and useless and sometimes really harmful to our purpose. But by your actions and a few remarks, you can often win the most stubborn case.

Erin Go Higher

Chauncey Olcott, the Irish actor, was to play at the Tabor Grand Theater, in Denver, and in view of the popularity of the coming star the management advanced the price of parquet seats from a dollar to a dollar and a half.

The first man in line when the box office opened for the advance sale was an elderly Hibernian. He laid down two silver dollars on the shelf.

"Give me a couple of good seats for Chauncey," he said.

"One dollar more, please, said the box office man.

"Why so?" demanded the patron suspiciously. "I never paid more'n a dollar to see Chauncey before."

"Yes, I know," said the ticket man, "but you see, Dave Warfield, who is a Hebrew actor, is playing up the street next week at two dollars. We thought if a Jewish comedian was worth two dollars, an Irish comedian ought to be worth a dollar and a half."

"Is that so!" snorted the customer. He snatched his silver back and slammed a wrinkled five-dollar bill down instead.

"I want two tickets," he roared; "and don't give me no change back out of that five-spot neither, young man. If a Jew is worth two dollars, Chauncey is worth two and a half, and not a cint less."

USE OF SPENCE-METAL MODELS IN CROWN AND BRIDGE WORK

BY LEWIS G. WATKINS, D.D.S., DETROIT MICHIGAN

It has been my experience that Spence-metal is a most valuable material in producing models to be used in the construction of bridge work where a very accurate bite is desired. Models made of this substance are much sharper than plaster and when mounted upon the articulator, stand hard usage without bruising or disturbing the occlusal surfaces of the model teeth, so apt to occur when plaster models are used.

The method of procedure is as follows: Place the abutment pieces (crowns or inlays) in position, warm a sheet of Detroit modeling compound and secure a bite by having the patient close the teeth firmly upon it. After this is accomplished, take a plaster impression of the abutment pieces and adjoining teeth, and a plaster impression of the teeth to be articulated. As soon as this is finished, the abutment pieces are placed in the impression and a thin coating of moldine clay mixed with water is painted over the cavo-surfaces of the inlays, or in the case of shell crowns, they may be partially filled with moldine, thus avoiding undercuts, which would prevent their removal from the model. The impressions are then well saturated with kerosene, and strips of moldine clay built up around their margins to confine the Spence-metal and prevent it from overflowing. We are now ready to pour the Spence-metal, which has previously been melted in a small granite iron sauce pan over a slow flame.

Impressions must be poured as soon after they are taken as possible. Should they be allowed to stand long enough to dry out, it will be necessary to thoroughly saturate them with kerosene to prevent the Spence-metal from adhering to the plaster. Care must be exercised in melting not to overheat, since the sulphur in the compound will be driven off, producing an objectionable odor and making the metal stiff like batter. If overheated, remove from the flame and wait until the molten mass thins, and the bubbles have nearly disappeared. When the consistency of the material is smooth and fluid, resembling ink, pour into the impressions. Hardening will take place immediately. Now place them in water, separate models from the impressions, scrub them and articulate. The abutment pieces should be loosened so that their removal may be easily accomplished, thus making it possible to remove the waxed bridge work for investing.

Success with this method is assured, because after the piece is soldered, it may be again placed upon the model and any slight adjustment of the articulation made.

THE RELATION OF MOUTH INFECTION TO SYSTEMIC DISEASE

BY DR. MARTIN H. FISCHER

(EICHBERG PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF CINCINNATI)

(Continued from page 622—August Summary)

ILLUSTRATIVE CASE REPORTS

Among the patients whom I have seen, I remember one of my surgical friends who, for some reason or other, had lost all his teeth except five lowers. He wore an upper and lower plate. He used to have his faithful five treated by the best prophylactic dentist that I know and he went regularly and conscientiously to have done whatever he was ordered to do. After a series of minor attacks associated with great pain, he developed a weakness of the right arm. Being a surgeon, this was equivalent to robbing him of his best instrument. The pain and weakness was due to pressure upon his brachial plexus, occasioned in its turn, as the X-ray showed, by a thickening of the bony parts in the vertebræ of the neck. For three years he tolerated his incapacitated state, always in pain and constitutionally half ill. Then the five teeth were pulled. In a few weeks he got perfectly well and has remained so. With the long preceding history and his now entire freedom from any of his old signs and symptoms it is impossible to escape the definite connection between his teeth and his arm affection.

A year ago I had a man who, for two years, had been carried from one sanatorium to another because of a cardiac arrythmia. He would drop certain heart beats completely. I guessed that the disturbance was due to an involvement of the so-called His bundle of the heart and believed that a relatively small lesion might be responsible for it. At present one can hardly imagine such a focal involvement as due to anything but a focus of infection. It was incumbent, in consequence to look for a point of entrance. I discovered as such possibilities an infected bridge and two lower teeth that were running pus. I advised the patient to have the bridge taken off and the two teeth pulled. Strange as it may seem, that man recovered completely in two weeks.

Last year I also saw a man whose story illustrates the many roles that a streptococcus infection may play. He came to me because he had albumin and casts in his urine. He had been told that he had Bright's disease, and that his future was not an encouraging one. I learned in examining him that he had also had an infection of the gall bladder in the past year and this had been operated upon and drained. He had also had an acute appendicitis during this year, though not at the same time as his gall bladder infection, but following it. For this he had also undergone an abdominal operation. After recovering from it he developed an abscess in the deep tissues surrounding a shoulder joint. When I examined him he still had the plain evidences of a myositis in various muscles at the points of union of muscle with tendon, and he told me that his joints would occasionally swell. Except for a trace of albumin, all these signs and symptoms disappeared in a few weeks after six badly infected teeth were removed.

It is hard, of course, to consider as of any importance a dirty mouth and bad teeth when we are face to face with the "acute surgical abdomen," or when we are damning a man's future with the prospects of "Bright's disease," but does not this simple and so common case history teach us that we ought to?

I want to be correctly understood in these clinical experiences that I have just detailed to you. They are given to illustrate how clinical experience will verify day after day the intimate association that exists between focal infections and systemic disease. They are not cited, primarily, to show how the pulling of teeth "cures" systemic disease even when due to the organisms located in the region of the extracted teeth. It is a fact, however, that a removal of the original source or sources of infection leads to an entire clearing up of all systemic evidences of disease in a large number of instances, improves others tremendously and leaves but very few patients without some benefit. The remarkable thing is not that after removal of the original focus some of these patients show no improvement. The remarkable thing is that any of them do, because, of course, the systemic disturbances are due to the localization of micro-organisms here and these are not touched when you remove the original focus occurring in teeth, tonsils, or elsewhere. The improvement must be obtained in some indirect way. Of course, we stop by this means the periodic seeding of micro-organisms into the blood and so prevent new attacks and the progress of the disease. But apparently we help in other ways, too. By removing some of the infection, the patient has, temporarily at least, an overplus of his antibodies, or the local reaction following extraction, etc., may stimulate a greater production of such and these give the patient a boost which helps him to overcome the infection wherever else it may be in the body and so helps him along the road to recovery.

If this close relation between infected teeth and systemic disease is granted, then the teeth assume not only from a curative but still more definitely from a prophylactic point of view an importance that is not ordinarily accorded them. Not that many a dentist and many of you here tonight have not always recognized and met this important problem. But if my experience in the matter is any guide, then a majority of the dental profession certainly are not yet alive to the whole problem, and many things are still done by dentists which are of a type which, far from relieving these mouth infections actually bring them about or favor their development once they are established. It is for this reason that I am going to venture upon the exceedingly dangerous ground of saying, for just a few moments, what I think ought to be done about some of these infected teeth, or rather, what should be done in order that our teeth may never become the menaces to our general health that they now are.

REMARKS ON SOME DENTAL PROCEDURES

The reason I dare to speak upon this subject at all is because I think that the principles of science do not change just because the thing to which we apply them has a name different from the object in another field of knowledge for which we know these principles to work. In other words, the fundamental principles of general surgery cannot be abrogated just because we choose as the special field for our surgical endeavor, the mouth and teeth. That may sound like cant to you, but from conversations that I have had with some of my dentist friends, they seem to think that the teeth belong in a class by themselves and that they have nothing whatever to do with the other things that we have in our bodies.

Now, of course, the teeth are simply thirty-two bones in thirty-two joints. Even without adding to these the other bones and joints in the head and neck, upon which the surgical dentist frequently operates, he has here almost as many joints in point of numbers as an orthopedist is asked to work upon. And dentistry is to me, when rightly viewed, just as great and wonderful a surgical profession as is this other division of medical practice that we call orthopedic surgery. But I think that all of us will agree that we have never demanded of the dentist, as we have every right to do, the training and the skill of an orthopedic surgeon, and certainly there is a frightful gap between the principles of orthopedic surgery or of general surgery and the principles brought into play in the treatment of teeth.

The first thing that some dentists—please do not think I say this of all —the primary thing that some dentists forget is that the tooth is first, last, and all the time, a living structure. The reason I emphasize this is because dentists often work upon teeth and use things on them which they would not think of applying to the skin, to the peritoneum, or to the inside of a joint. Yet their effects on the teeth are just as disastrous as when smeared on the peritoneum or a joint surface. Great caution is certainly necessary in the application of antiseptic solutions that have any real bactericidal powers.

I am serious when I say that one of the reasons why the dentists generally get such very good results in their operative work is because they so largely work without any regard to antisepsis. Under these circumstances their grindings, etc., all occur in a live tooth and as long as it is still alive it is a hard thing to infect. This is but an application to the teeth of a surgical truth the full significance of which not even all the general surgeons have yet grasped. The difference in susceptibility to infection before and after the death of cells is easily proved. When, for example, any open wound that is covered with healthy granulations, is sown with bacteria (such as one of the pus formers, including the streptococcus), the chances of getting an infection are extremely small. But if at the same time that the bacteria are sown, a piece of gauze is dragged over the wound so as to crush the living and growing cells constituting the granulations, a beautiful lot of pus develops within a few hours. In other words, as soon as you have killed a tissue the liability to infection is very great, and this is true whether you call that tissue, skin, peritoneum, or a tooth. Infections gain headway when the tooth is dead. As I will point out in a minute, many dentists kill a tooth in any one of several ways and do not consider that they have done a serious thing. These considerations explain why soap and water cleanliness with a gentle touch may and does very frequently mean more to the surgical or dental patient than the most elaborate aseptic and antiseptic technic when followed by clumsy hands.

If then the greatest resistance to infection is offered by the living tooth itself, then let us, first of all, keep the tooth alive by keeping off it all antiseptic solutions which in their nature are of a type to kill the living tooth cells as readily as they are supposed to kill any bacteria infesting it; neither let us bring about such death by abusive cleansing methods, or through badly applied mechanical contrivances as in the applications of bands, crowns, bridges, etc.

But not only must we protect the tooth from external injury with its subsequent disastrous liability to infection, but still greater caution is necessary when work is done on the inside of a tooth. Many dentists "devitalize," I think, quite too readily. To devitalize means, of course, to rob a tooth of its life, and yet when I have discussed this question with dentists they are likely to talk about the procedure as if it meant a mere robbing of the tooth of its nerve supply. There is a fundamental error in this view. When the dentist devitalizes the tooth, that is, when in his own words he robs it of its nerve supply, he simultaneously robs it of its central, nutrient artery, which, when not done deliberately and with a full knowledge of the consequences, is little short of a crime. This destruction of the central blood supply to the tooth is analogous to the cutting off of the nutrient artery to one of the long bones, the inevitable result of which is a death of the bone marrow. Applied to the tooth, this devitalization means a death of the inside of the tooth. I know that some of you will say that all this makes no difference, because the tooth gets a second blood supply through its periosteum and this, it is argued, keeps the whole tooth alive. In the first place, such a statement is not true, and secondly, if it were, then a lot of the things that are done afterwards to such devitalized teeth are of a character that absolutely assure a suspension of any nourishment that is supposed to be brought thus vicariously through the periosteum. In other words, some dentists, after killing the inside of the tooth, later see to it that the periosteum is killed also.

Now why do I say these things? Simply because some of the commonest dental procedures, as the placing of a gold crown, do this very thing. It is the accepted procedure, I believe, to devitalize the pulp before placing a crown. This kills the inside of the tooth, as I have already said. To get a good fit for the crown, the convex sides of the projecting portions of the tooth are ground off, which means a killing of many of the living cells in this portion of the tooth. It is also generally accepted, I believe, that the crown must fit snugly about the neck of the tooth, projecting to or somewhat under the gum line. All dentists are agreed that if a snug fit is not secured infection is bound to occur and trouble to result. Let me insist that infection and trouble are just as certain if the crown does fit snugly; for when this is the case then pressure necrosis of the periosteum results. The inside of the tooth being already dead and the outside source of nourishment now being cut off by pressure, what, pray, keeps the tooth alive? Is it any wonder that such teeth are liable to break off at the neck? And when to secure a perfect fit or to make good a tooth defect extending under the gum line, the dentist first strips back the gum or forces the crown deeper, what but disaster can be expected? Under the gold, always when badly placed and nearly always even when well placed, we have dead bone and as a corollary, infection. If you do not believe this just examine these crowns carefully yourself. In the course of routine physical examinations I looked at the teeth of all the patients I saw one week, no matter what they came for. With one exception every gold capped tooth that I looked at ran pus, the exception being one which had been crowned only the week before. I confess to having been shocked when on referring these patients back to their dentists they returned to me with the statement that their dentists declared their teeth in good order. One dentist wrote me that the pus I observed was the normal secretion from the gums.

The important thing in all this is that every such crowned tooth and, of course, every other infected tooth whether it is crowned or not, constitutes a focal infection from which any of the serious things we have previously discussed may result. Mind you, I do not say *will* result—Nature is very kind to us—but *may*. The day is coming, I think, and very soon, when a gold crown placed as I have described will not be put on any more. And when such gold crowns go, many another now popular piece of dental engineering will also pass out.

SOME SUGGESTIONS

Since I condemn in this wholesale fashion you will perhaps retort by asking me what I think ought to be done. As in talking dentistry I am entirely out of my field, it is perfectly right for me to assay an answer.

The first thing is, of course, the old story of prophylaxis. We cannot put life back into dead teeth or make new ones where they have been lost. Of first importance is the preservation of our heritage. I know how much the dentists have done in this direction already, but still more must be done. I confess to a complete discouragement at the present time regarding our ability to handle the teeth once they are at all extensively infected. I have thus far not seen any real cures of any of the more deeply or extensively infected teeth by the schemes popular with various skilled dentists. We seem to lack entirely at present any effective, conservative way of handling such infected teeth. Nothing has done any good in my experience except extraction. I shall return to this subject again in a moment.

Hence my repetition of your own estimable teaching—everything possible must be done to keep the tooth from decaying and the peridental tissues from becoming infected. The day of the dental quack who "cleans teeth free" by way of getting what looks to him like a real dental job, is over. The cleaning and keeping clean is going to be the big job in itself. And the public is shortly going to recognize its importance and prove willing to pay for it more readily than it does now for the gold crowns it exhibits so proudly.

But suppose that in spite of all care, infection and decay does get a foothold or has already obtained such from the time we first see the tooth. Let us limit ourselves, for the moment, to decay in the protruding portions of the tooth. The obvious thing to do is, of course, to grind away the affected portions and to fill; and we are going to keep on filling as long as we can, and when we can not longer fill or such is not best, we are going to put in inlays. And when the inlays are so large that they will not hold any longer, then what shall we do? It is common to crown, but in my opinion it is far better to follow a surgical procedure to which some of my dental friends resort—put in the necessary inlay and then half crown to keep the inlay in place. A half crown, is of course, the expression of a good surgical principle. An inlay may even be used if the decay extends below the gum line in some portion of the tooth. With the half crown to hold it in place we jam nothing under the gum line and so keep the living portions of the dental periosteum in a functioning condition. With the half crown the upper tooth structure does not have to be destroyed and, maybe, even with the inlay no devitalization of the tooth pulp may prove necessary. This avoidance of devitalization is most important. For reasons already discussed, devitalization defeats us from the start.

When the upper half of the tooth is so badly shattered that inlays or inlays with half crowns no longer prove adequate, then the jacket crown is next to be considered. The important thing about the jacket crown is that it does not necessitate devitalization of the tooth. As soon, of course, as a tooth is or has to be killed the jacket crown is largely useless, because the mischief is now done and it does not add much to stick on a porcelain crown, for example, by the old peg method. But as long as the tooth can be kept alive it is our sacred duty to keep it so, wherefore the superior merits of the porcelain jacket crown which, well cemented upon the healthy root-remains of a tooth, expresses to me the very acme of surgical thought, ingenuity and skill. Its expense has been urged against it; but has this ever been an adequate argument in medical and surgical practice? Whatever its cost, is it not cheaper than gall stones or appendicitis and a fortnight in the hospital?

Thus far in our discussion we have assumed that our tooth has no infection about its root (as a pyorrhea) and that the extension into the tooth through the head has not been of a character to make devitalization anything but a matter of choice. But often, at least in the light of our present knowledge, devitalization has to be practiced as a matter of necessity. Are we never to devitalize, even under such conditions? I would say, never without the full realization of what the consequences are likely to be. The chances for future trouble are nine to one. If you will examine by clinical methods, or better still, with X-ray, the teeth you have devitalized, you will discover trouble about nine out of every ten of them. Now where are you going to find it? A lot, and the most dangerous part of it, is hidden from the casual eye. The X-ray shows it at the root-tips and about these. Moreover, not a little of this trouble has been planted there by the dentist. The same needle or bur or hair that kills or fishes out the dead dental pulp carries micro-organisms that may have been of a harmless enough sort outside, but sealed in the bottom of a tooth cavity away from oxygen they may and do develop pathological properties of no advantage to their host. There is many a blind abscess at the bottom of devitalized teeth which discloses itself only by an occasional tenderness on mastication, by gum boils with rupture and discharge of pus, or by none of these things, but only as we search with X-rays.

How, after all, can we expect anything but deeply infected teeth under present conditions of education in matters dental? An established infection of the tooth is at present the *sine qua non* almost of that which brings the patient to the dentist; and devitalization whether performed in ignorance or because of necessity does the rest. Devitalization means dead bone, and such will not stay in the tibia or in the femur; nor will it in the tooth just because the necrotic area is small and we give the bony growth a special name. If devitalization must be done, let us keep clearly in mind this double danger of infection and dead bone. Much can be tolerated of either alone, but very little of the combination. Hence my insistence upon a careful review of the methods in vogue which are intended to put an end to infection and, on the other hand, of our mechanical methods which are so deadly. No doubt it is well or necessary to use arsenic, strong carbolic acid and trichloracetic in many dental procedures, but let us keep in mind their death-dealing properties to tooth structure while using them to kill an infection. And if certain mechanical ideals are accepted as correct, then let us view an occasional X-ray plate of our work to learn definitely just how close to the ideal we have come. If, for example, a filling of the root canal is regarded as desirable, then the X-ray shows that what is actually accomplished in this direction is pitifully short of the ideal, for in my own experience only about one in twenty is ever thus filled. And let me add that the batting average of men in the country are likely to be as good in this regard as those of many a professor in a dental college. Of the necessity of obtaining close co-aptation in the placing of peg teeth and porcelain crowns I think all are agreed, but, sad to relate, I have seen the work of instructors in this field show air spaces between the surfaces of the amputated teeth and the superimposed restorative portions. This means infection, of course, and death of the roots under the porcelain tops, provided the roots were not killed in the very beginning. • These teeth may be the joy of the wearer and friends when viewed superficially, but they are whited sepulchres hiding a foul basement.

THE FOUL BREATH AND THE COATED TONGUE

Now that I have used the word "foul" let me interpolate a few remarks on this whole question of foul mouth, foul breath and coated tongue. I have read long dissertations in medical books on all these terms, and it is remarkable how far from the real source of trouble authors will lay the origin of all these conditions. I am convinced that every such state—barring the few cases we observe in the hospital which usually concern the acutely and desperately ill—I am convinced that every such state means something wrong locally in the mouth or head, usually just mouth, and about equally divided between infections of the teeth and of the tonsils. The probability that the tonsils are at fault is somewhat higher in children than in adults, while the opposite is true for teeth. Neither rule, of course, holds absolutely, because even young children have badly infected teeth and many adults given to holding on to everything they can, refuse to part with even desperately infected tonsils because they think someone may some day discover a function for them. I look and thus far have not failed to find infected teeth or infected tonsils in every ambulatory patient who has a bad breath or a coated tongue. To blame these things on the "stomach" or "digestion" is to say nothing at the best, and, at the worst, it lulls the patient into a state of false security about himself. Perhaps some of you would now like to ask: "And is there not a relation between these foul mouths, these infected teeth, and the 'gout' and 'rheumatism' of which these patients complain?" The answer very decidedly is, Yes; only the teeth did not attain their state through the gout and rheumatism, but the other way about—the infected teeth are the cause of these.

Our discussion seems to have strolled from the fields of prophylaxis, fillings, inlays and crowns to the less pleasant ones of pyorrhea and its several adjectives. Let me add my protest to that of many a dentist who insists that this term is not broad enough, for the pus in pyorrhea does not always flow. The all-important fact to keep in mind is that underlying it, no matter how restrictedly or broadly the term is used, is the outstanding fact of its infectious origin. The number of infectious organisms that may be or are responsible for it is, no doubt, several, but that it is an infection of the dental and peridental tissues, that is the fundamental thing. And these infections have a beginning. It is then most can be done to overcome them and hence the importance of recognizing the *early* evidences of infection. Every tender tooth, every tender gum, every bleeding gum, and the slightest evidences of pus formation mean something. The red, soggy gums of the kitchen help and of the young male laborers who abhor a toothbrush are all expressive of infection and are the red flags of danger ahead. And the flag is just as red and full of meaning when the higher strata of society are attacked. The ignorance of the individual most commonly attacked makes reform here look desperately unpromising, but we need not add to the whole problem by having some of our professional brethren say there is nothing wrong with these mouths.

CONCLUDING REMARKS

What now are we going to do with these infected mouths? Lest I be misunderstood, let me repeat how much regard I have for all the splendid work our American dentists have done in the way of preaching, teaching, and bringing to pass mouth hygiene, and how many teeth I think they have succeeded in saving, to the everlasting benefit of their patients. Please understand that I am not opposed to any of this. What we need to decide is whether there can be reached or, better, whether with our present limited knowledge of what can be done for the infection itself, whether there has not already been reached the point of diminishing returns in this matter of tooth preservation. My patients return to me from the dentist, time after time, with the statement that a peg tooth, a crown, a root, or a piece of bridge work "need not come out," or that the involved tooth structures "can be saved." I know this in advance. What I would rather know is whether at the same time the patient can be saved. The debate is not between the relative merits of losing a tooth and saving it, but between the maintenance and the cure of an infection. I am not for extraction just because it is easy. I come to it as you do, as a last resort. It is not the matter of a choice between an evil and a good thing, but that between two evils. It is too often a choice between a much desired cosmetic effect and illness or death; or a loss of some or all the teeth and recovery from systemic disease.

But while thus interested in all types of prophylactic work which promise conservation of these infected teeth, let me confess to a most discouraging experience in the matter of actual results obtained and obtainable in the mouth infections upon which some of my dental colleagues have worked. The only infections that I have ever seen clear up are those limited to the superficial portions of the teeth themselves or to the gums and peridental structures when the infections have started at the gum line and worked only a short distance down the body of the tooth. Here the infections can often be reached rather easily by chemical and mechanical means and the results are really gratifying. I have never seen an infection that has penetrated deeply along the peridental tissues, as down to the tip of the root, that has been cleared up. Worst of all are the infections which have burrowed up from the root following infection by fair means or foul of the dental pulp itself. None of these have I ever observed to clear. I have always been glad, and shall continue to be, to study the work of men who think otherwise, not only that of the conservative scalers who employ hand tools, but also that of the radicals who start out with motor-driven vehicles. After the work of both I have, of course, seen the teeth assume a better appearance, the gums look less soggy and loose teeth tighten up a bit. But all this means little if the general condition of the patient does not improve or, as is so commonly the case, new "rheumatic" and "gouty" attacks accompany the dental work or appear in patients who never had them before.

I have been shown the usual X-ray plates which show how after such scaling new bone is formed and all that sort of thing. All this is true, but new bone formation and a little better set to the teeth is not all we want. We want freedom from infection. Bone formation and plenty of it occurs in all bones and their periostei whenever there is an infection of these structures. But a surgeon in such cases does not try to see how much of the separated and dead bone he can get to grow fast in his patient. He pulls all this out. Nor does he expect his infection to cease until he has done this very thing. Whether we call the dead bone a dead root or a devitalized tooth or what you will, the problem is exactly the same. We need to get rid of these as of dead bone elsewhere in the body, and then the infection will usually take care of itself. In the patient with an established or threatened systemic infection the important thing from his point of view does not reside in the question: "Have the teeth been saved and has the mouth been made to look better?" but rather in this: "Has the focal infection from which the systemic has arisen been gotten out of the way?"

If our judgment or necessity calls for devitalization and our surgical opinion says that this is better than extraction, then let us keep the probable future of the tooth thus treated ever in mind. When in later years nine out of ten such teeth return to us infected, atrophied, loose, and especially if there are systemic disturbances attributable to it, then had it not better come out?

Perhaps the day will come when less radical measures than those which in my experience have alone proved availing will be the order of the day, but progress here is going to be made, not through a greater attention to the mechanical aspects of dental surgery but to its bacteriological side. New light will come as clinical observation and laboratory experiment bring us a better knowledge of what are the conditions which render us liable to infection whether in a tooth or elsewhere and of what are the means of defense which the body uses to overcome such. American dentists like their surgical colleagues are today talking too much of mechanics and too little of surgical principles. There is a lot about hammers and tongs and new methods of nailing things together and too little, it seems to me, of why we live and die.

DISCUSSION

DR. H. T. SMITH: I could not tell when I was asked to discuss this paper from just what angle Doctor Fischer would approach his subject, so I thought it worth while to present firstly a brief review of the literature of oral infection, to show that the subject is not an absolutely new one to the dentist, nor to the physician, and that the dentists who have been paying attention to their pathology have been watching these very conditions which Doctor Fischer has recited to us tonight, and have had them under fair control. The following is a hasty review of the literature of oral infection and not a complete bibliography:

In 1884, G. V. Black published his book on the "Formation of Poisons by Microorganisms in the Mouth," in which he reviewed the germ theory of dental caries and studied also the action of the mouth flora in producing inflammations in the soft and supporting buccal tissues. These studies were made possible because of the researches of W. D. Miller, published in the *Independent Practitioner*, 1882-3, and Miller's work in turn depending upon the then-new bacteriology of Koch, of Berlin, in whose laboratory Miller made his dental experiments.

With the appearance of the second edition of Burchard's Dental Pathology, in 1898, the dangers arising from oral infection began to be emphasized and taught. In 1891, Wm. Hunter, of London, published his book called "Oral Sepsis as a Cause of Septic Gastritis, Toxic Neuritis and other Septic Conditions." This was a reprint of papers appearing in the *Practitioner* of the previous year. In his preface he says: "The book is published in this separate form in the hope that it may serve to draw additional attention to a course of disease extremely prevalent and most egregiously overlooked." This was a fair recitation of the symptoms and pathology of pericemental and alveolar disease as they were then (fifteen years ago) understood, the book attracted much attention and was widely distributed.

In 1892 Forcheimer published his book on the non-surgical diseases of the mouth in children in which he called attention to the pathogenicity of certain of the gingival and buccal inflammations in children's mouths, to be followed more recently by Doctor Rachford's book containing similar chapters.

In 1899, John Fitzgerald published his little book on "Pyorrhea Alveolaris," calling especial attention to streptococcic infection in pyorrhea and stating that "it is an attempt to point out the bearings of this disease upon medical practice." He traces the history of this disease to the early work of Dr. J. M. Riggs, of Hartford, in 1844, whose name still remains attached to the disease in the nomenclature of the profession and of the laymen. In 1877, Dr. F. H. Rehwinkle, of Chillicothe, at a meeting of the American Dental Association, proposed the name Pyorrhea Alveolaris for the general pericemental inflammations which name is generally used at the present time.

Wedl, who wrote in the early forties, is said to have used the name pyorrhea alveolaris, but I have not as yet been able to trace it. Pyorrhea as a generic term is open to much criticism, because it describes only a symptomatic phase of one of the diseases of the pericementum. Dr. L. S. Medalia, of Boston, suggests the name "chronic alveolar osteomyelitis," recognizing the involvement of the alveolar bone in pronounced cases.

In 1911 appeared Dr. Stanley Colyer's book on "Dental Disease in Its Relation to General Medicine," in which he devotes 34 pages to the chapter on oral sepsis. The book deserves the careful perusal of every physician.

Each succeeding edition of Burchard amplified our knowledge of this special pathology. The art of crown and bridge work was at this time developing rapidly, the conservative and thoughtful dentists were using the appliances and filling root canals with a due regard for and a knowledge of the dangers of infections from imperfect methods. Not so, however, with a class of second-rate dentists who crowded into England and after a time the evidence of their handiwork was plain to be seen in the gingivitis and pyorrheas from audacious crowning methods; alveolar abscesses from septic root canals, chronic suppurative pericementitis from a disposition to retain in the mouth pyorrhetic and abscessed teeth and to utilize them for crown and bridge attachments. All this brought forth a second paper from Wm. Hunter, in 1904, rather severe in its denouncement and unfortunately it was interpreted by a popular American monthly magazine as a criticism of American dentistry in general. Its wide circulation disturbed the lay mind, and people thought twice when bridges and crowns were proposed for their mouths.

In 1911 appeared H. P. Pickerill's book on "The Prevention of Dental Caries and Oral Sepsis," which divided its interest between new theories of the etiology of dental caries and the pathology of oral sepsis. C. J. Grieves wrote the same year in the *Items of Interest* on systemic pus poisoning associated with disease of the dental apical region. In 1911 Dr. P. W. Howe also published in the *Cosmos* his paper on "The Dietetic Effect of Oral Secretions," and Dr. E. C. Kirk's strong editorial on prophylaxis appeared in the same journal.

A real interest in the subject, at least in the medical mind, was inspired by the beautiful paper of Dr. C. H. Mayo, delivered before a Chicago audience and published in the *Dental Review*, April, 1913. The closing sentence of his paper had a most prophetic ring and it has since been used almost as a refrain by every dental and medical essayist when he approaches the subject of oral sepsis. I heard it quoted a half dozen times in as many addresses at the dental meeting this week at Ann Arbor. The discussions of Mayo's paper were equal in interest to the essay itself. They were by J. L. Gilmer, E. C. Rosenow, J. B Hartzell, Arthur Black and C. F. Blair. The same year appeared C. J. Grieves' paper in the *Journal of the Allied Societies*, "Observations on Mouth Conditions as Related to Pyorrhea Alveolaris," and his other paper, "Infections Resulting From Lowered Vitality Caused by Unhygienic Mouths," published in the *Dental Cosmos;* also M. L. Rhein's paper on "Mouth Infections," in the *Journal of the American Medical Association.*

In 1913 was published also Dr. L S. Medalia's exhaustive paper on "Chronic Alveolar Osteomyelitis, Its Causes and Treatment with Vaccines."

In 1914 probably no contributions equal the group of papers read before the Section of Stomatology of the Am. Med. Asso., on "Mouth Infection as a Source of Systemic Disease," by Drs. C. H. Mayo, E. C. Rosenow, Frank Billings, C. Burns Craig, Thos. L. Gilmer and A. M. Moody. The discussions, with what Doctor Fischer has said to us tonight, would seem to bring the matter about up to date.

There should be mentioned also another paper by our old friend, Wm. Hunter, of London, published in the October number of the *British Journal of Dental Science*, bringing his own series of efforts on oral sepsis up to date.

The foregoing does not pretend to be a complete bibliography upon the subject of oral sepsis, but it is rather a partial review of the literature to indicate that the dental profession has long recognized the dangers of systemic infection from oral lesions, and has applied its medicinal and mechanical therapeutics with a proper regard for that danger. In regard to pyorrheal pockets as foci of infection, it is curious to note that the extensive bacteriological tests of Doctor Medalia in pyorrheal cases, published in 1913, did not show the presence of the entamœba buccalis, nor does Goadby mention its appearance either in his Mycology of the Mouth, or in his paper in the *British Medical Journal*, in 1905. Medalia's cultural findings in 112 cases were:

Pneu. (strepto. lanceolatus pneumoniæ)	26
Pneumo. and staphylo	67
Pneumo. and strepto	3
Pneumo., staphylo. and strepto	10
Pneumo. and Micrococcus Catarrhalis	1
Staphylo and M. Catarrhalis	2
Staphylo. aureus	2
Strepto. and staphylo	1
Sterile	3

The very recent findings of Dr. Angelo Chiavaro first called our attention to entamœba in the mouth. He notes its presence in 36 out of 68 cases. He found it in the materia alba of dirty mouths, but not in the materia alba of clean mouths. It was not found in the hard tartar precipitates. It was not found in debris of carious cavities (the reaction there being acid). He found them constantly present in the purulent secretion of 21 cases of pyorrhea alveolaris. After irrigation of a pyorrhea pocket with inorganic acids, the entamœba disappeared. He found them present in a yellowish deposit on the teeth and absent in a similar greenish deposit. He did not find them in the gangrenous dental pulp nor in the pus of a cutaneous buccal fistula, but found them abundantly represented in the pus of a large alveolar sequestrum.

Chiavaro's experiments were followed by those of Dr. Wm. T. Barrett, of Philadelphia, who confirmed the findings and introduced therapeusis with emetine hydrochloride. Barrett found the entamœba buccalis present in the pyorrheal pus of every one of 46 patients. He finds the emetine to be a positive amœbicide in the mouth. In October, 1914, Dr. C. C. Bass, of New Orleans, reported his experiments, confirming Doctor Barrett's findings and calling his paper, "The Specific Cause and Prompt Specific Cure of Pyorrhea Alveolaris or Rigg's Disease." It occurs to me that this last paper may be premature in its conclusions, as to the entamœba being the specific cause of pyorrhea, while there is no doubt as to the great value of emetine in pyorrhea treatment. Chiavaro says that the entamœba is not pathogenic in the mouth, but as it feeds on bacteria, is rather phagocytic in its action, and is probably an aid to disinfection of the mouth. If this is true, it is the bactericidal rather than the amœbicidal action of the emetine hydrochloride, that is giving the almost specific results. Doctor Price, who is watching oral sepsis rather closely through the research bureau, told me a few days ago that the entamœba was present in only about 5% of the cases examined, that it is differentiated with considerable difficulty from another protozoa sometimes present, that it is stained with considerable difficulty, that its movements across the microscopic field are very slow, that there are prolonged periods of rest between the projecting movements of its pseudopods. He says, however, that emetine hydrochloride is probably the best germicide we have ever had in pus pockets in the mouth.

It has been a great pleasure to hear Doctor Fischer's description of the pathological changes that may result from oral foci of infection. Only the trained teacher could so beautifully place before us the mental pictures of the minute normal anatomy, then the changes that take place in structure and in function. His graphic description of the newer conceptions of valvular disease of the heart, arteriosclerosis, gastric ulcers, anemia, nephritis, etc., as the results of infection carried through the blood stream, will make these diseases more understandable to us all.

I cannot criticise them, they are only to be commended, yet I wonder at the exactness of the structural changes which Doctor Fischer pictures. Whenever he adds two and two together, the sum is always four. In our diseases of the dental pulp I regret it is not invariably so; sometimes it is five, sometimes three. But this much we dentists can tell him, that his conceptions of minute dental histology and pathology need some revision. In the first place a human tooth as a whole is not comparable to a human bone as a whole. A tooth with its pulp removed is not a bone with its marrow artery cut; a dead tooth, as he calls it, is not a necrosed bone to be cast off as a sequestrum.

The principles and practice of dentistry are too firmly established to admit of doubt as to the usefulness and safety of a tooth with the pulp removed and the canals properly filled. It has not lost its resistance to infection as he states. It is a vastly more tolerable tooth than one with a hyperæmic pulp, it is also a much safer one than a tooth with an infected pulp. It is the inflamed and degenerative pulps sealed under fillings that produce acute and chronic alveolar abscesses to as great an extent as do devitalized teeth.

These are the teeth that show the lessened resistance to infection not only intrinsically through defects in structure and fillings, but extrinsically through the blood stream at the apex. They are more dangerous than the pyorrhetic teeth, because the latter ordinarily have drainage into the mouth.

Every fair-minded dentist admits his difficulties and failures in filling root canals, but we must remember the great number of successes, as well, and not lose confidence in the operation.

I am at a loss to understand Doctor Fischer's objection to our use of strong germicides and disinfectants. We do not use them in contact with oral mucous membrane; we do not force them through the canals into normal periapical tissues. We do use them to promote granulation in pyorrhea cases and we use them in dentine cavities where the pulp is protected and we treat root canals with them at times, and why should we not? as the surgeon paints the stump of an appendix just removed with pure phenol and closes the wound. The caution against injury of periapical tissue by penetrative drug, such as formalin, is, however, one which we are heeding and studying.

When Doctor Fischer tells us what kind of crown is best and talks of cavity and gingival preparation, he virtually admits that he has been so occupied with medicines and research that he has not fully mastered the technic of dentistry; so that we can best leave the entire matter in the hands of his personal dentist, who can tell him what is best for his individual teeth, and I trust he will exhibit the same confidence that he would wish shown by his own patients.

The dental and medical professions are proud of the research work that Doctor Fischer has done in Cincinnati, more particularly in oedema and nephritis, and as a layman I am glad of the opportunity of saying that I am under everlasting obligations to his new method of treatment in a case of acute nephritis in my immediate family.

Doctor Hogan, San Francisco: I have only a word to say. I have listened to the talk of Doctor Fischer, and I must say he has attacked the subject as he usually attacks subjects. I have listened to the stimulating discussion of the gentlemen who have followed him, and especially this last discussion, and as you have come to hear Doctor Fischer tonight, I think, the time being late, Doctor Fischer's hands will be completely filled in answering some of the questions that have been placed before him. I have done a good deal of this work and am fully in accord with him. I have talked to the dentists in our town and got myself into trouble, as Doctor Fischer has in various places that he has visited, and I think it no more than right that we should hear what he has to say in rebuttal of what the others have said. I do think he attacks the subject sometimes in rather a brutal way, but I rather think he usually ends by conciliating us.

Doctor Doughty: I do not think there is very much left to be said from an X-ray standpoint. Doctor Lange has unquestionably been the pioneer in this line here in town and has so religiously worked out this field that most of the rest of us are followers. I do think there is a great deal in what has been said here in regard to the crowns and whether they are properly put on or are liable to infection. And as to these abscesses in the jaw, there is only one thing that I have found in the work, and that is that while the dental profession seems more or less enlightened on this subject and a great many cases come from the dental men, sent to them probably because of some trouble with the teeth, and they want a dental examination with the X-ray, they probably find some source of infection. I find a great many cases of these joints, and various other infections that come in from the medical men are not sent in with any reference at all to the teeth. They have been sent probably to a man who examined the throat and nose, etc., but they are not sent in primarily to examine the teeth, to examine the joints, and of course the nerve only where they had the pain. Only through learning from the dental men have we learned to look more or less into the teeth and examine them with the X-ray in connection with finding out whether or not there is a source of infection in the jaw, and for that reason I am inclined to repeat the statement that I have often made, that the education of the medical profession along this line I think is a larger field than the education of the dental men along this line, as I believe they do not understand this work nearly as thoroughly nor the sources of infection, with the exception, of course, of such men as Doctors Fischer, Rosenow, etc., but I believe that the combined work of the dental men and medical men—the dental men as they are being often referred to as consultants, and not to a separate line of medicine where there is a special line of consultants in this line of work. I believe this education will result in a great deal of benefit both to the medical profession and certainly to the patients.

Dr. C. H. Schott: Some of Doctor Fischer's work has been severely criticised by various members of the dental profession whose patients have been advised by physicians to have one or more or even all of their teeth extracted when they were unable to find the cause of some obscure trouble before consulting a dentist, simply because Doctor Fischer has said that many of the infections and diseases of the body can be traced to foci of an infection in the mouth and about the teeth.

Now, the great danger of such radical advice lies in its misinterpretation and its application to all cases without the most careful consideration from the dental as well as the medical viewpoint.

While I agree that abscessed teeth, putrescent pulps, pyorrhea conditions, devitalized teeth may cause serious trouble if not carefully treated, still I do not think that it is wise to advise extraction in every case.

It seems that a great many of the medical profession have just recently realized that the mouth is an important part of the alimentary tract, and are now expecting to find the cause of all cases of arthritis and the many other diseases which are supposed to be caused by infection, in the mouth. However Doctor Fischer is doing wonderfully good work, if even to some he does seem a little radical, for he is inspiring the dentist who has not been as careful in the past, to do more careful and thorough work in devitalizing pulps, treatment of abscesses and the filling of root canals.

Doctor W. M. Clawson: I enjoyed this paper immensely and I am heartily in accord with the general trend of the paper, that systemic conditions are in a great many cases largely due to mouth infections that we have lately become well aware of; especially ill-fitting crowns under the margins of the gums, those which impinge upon the dental membranes, etc., imperfect root canal fillings. But the devitalization, and I do not say this because I believe in devitalizing wholesale, I believe in devitalizing only when it is the lesser of two evils—but I have seen case after case where a tooth has been devitalized and crowned, where crowns fit well, when those teeth were in better condition pathologically than any other tooth in the mouth.

I can show cases where fifteen years ago teeth that were abscessed, absolutely abscessed, had been abscessed for two and three years, were treated, crowned, the roots filled and those teeth today are better than other teeth adjacent to them that were in perfect condition at the time that this was done. I can recite one case in particular where a man presented himself, where he had erosion of the teeth to such an extent that the nerves were in some cases actually exposed from erosion. In that mouth I devitalized under high pressure anesthesia fifteen teeth and crowned them, principally with crowns which had no bands whatever, and I can show as healthy and fine looking a mouth as you want to see, and I would be glad to have Doctor Fischer examine that mouth. I am saying this in defense of devitalization where devitalization is necessary. That man is in better condition physically and enjoys himself better than he ever did in his life. And I say this only in defense of devitalization where devitalization is the lesser of two evils. I attempted that case where several other dentists had refused because they did not want to devitalize those teeth. I made the remark to a dentist that I had devitalized fifteen teeth in one mouth in one week, and he said, "Weren't you afraid to attempt that?" Why should a dentist be afraid to attempt several devitalizations in one mouth, more than he wou'd several in different mouths? There is not a particle of reason why he should not do so.

And there is another question I would like to ask Doctor Fischer: In extracting a tooth while it was in a state of acute dental alveolar abscess, speaking of the troubles that arise from the change of the nature of the germs, in that case would that change be as likely to occur if the abscess were lanced first and then extracted later? The conditions are simply ameliorated. We do not cure the abscess in lancing the gum; we simply wait until the acute stage is past. Also, whether there is any difference in operating on that tooth in the alveolar tissues than in extraction; whether there would be any more likelihood of those changes occurring than there would in any other surgical operation on any other bony tissue of the body.

This story was told by Doctor Thornton in a discussion of Doctor Vaughan's paper on a similar subject at a recent meeting at Ann Arbor, that Doctor Thornton was on one occasion detained for the afternoon at a small city in Michigan. While he waited about the hotel he found a man with a cinder in his eye. This man was waiting for the return of the local physician who was to look at his eye, but being in great pain he asked Doctor Thornton to treat and relieve him at once. Doctor Thornton explained that he was not prepared to examine his eye with proper instruments and sterile materials, and preferred not to take the risk of infecting the highly inflamed eye, and to divert the man, told him of a case in which an acquaintance asked a fellow office clerk to treat an eye that was inflamed by a cinder. This the fellow clerk did by taking his handkerchief from his hip pocket, rolling the corner into a cone in the classical method of the layman and probing the eye for the offending cinder. Infection occurred and the clerk lost his sight of that eye. Doctor Thornton said he would accompany the man to the physician's office, which he did. They were met by a kindly old doctor who assured his patient that they would soon have his eye in good order again, and with that he took a soiled handkerchief from his hip pocket, rolled it into the aforesaid classical cone and proceeded to probe the eye with it. Is the poor layman ever safe from infection?

Dr. Rauh: I wish to put a question.

What are we to do with these cases from the dentist's standpoint?

If Doctor Fischer has the temerity to answer, we would be very thankful, but it is more for the dentists. The latter are confined within four very small walls, they do not see very many patients, not as many as the average medical man would imagine. In the Free Clinics, within the past five years, more patients have been treated than in many practices and we do not know what to do with these abscess conditions. So it is a constant problem.

Our patients are all below the age of 16, the majority varying from 5 to 12 years.

Numerous cases of broken down first molars that either require devitalization or that already have diseased pulps are encountered, to say nothing of deciduous teeth in the same condition. What shall we do with them? Are they to be extracted or shall they be treated and filled with possible or probable secondary infections resulting? If extraction is resorted to the proper growth of the alveolus cannot take place and if treated the situation is particularly trying owing to the lack of development of the roots.

We have a large responsibility and further investigation should be undertaken.

Is promiscuous extraction to be the answer?

Doctor Fischer (closing): I do not pretend to be able to answer all the many questions that the generous discussion of my remarks has evoked. Some of them, I am afraid, must be answered by asking questions of the dentists themselves who have had experience in these fields far beyond anything that medical men have seen.

Someone has asked a question which is frequently brought up: "Why is it that so many who suffer from infected mouths show no systemic disease?" Let me say, first of all, that many of these do show systemic disturbances, only the true origin of these systemic disturbances is not recognized. As our diagnostic skill in medicine grows and as the causal relation between systemic disease and focal infections becomes more generally known we shall recognize many more systemic disturbances as the consequence of infected mouths than we do now. On the other hand, it need by no means follow that just because systemic disturbances of certain types are due to focal infections that therefore every focal infection must give rise to systemic disturbances. Infected wounds, for example, are frequently the source of bacteremias and lead to metastatic infections in different portions of the body, but just because this is so we do not expect every infected wound to give rise to such systemic disturbances. Exactly the same argument holds when for infected wounds we substitute infection of an alveolus or some similar mouth condition.

I have admiration for the wonderful mechanical work that can be shown us by our dental colleagues, but as one of you has well pointed out, the most brilliant mechanical procedure becomes worthless if it does not succeed in stilling at the same time the infectious process which necessitated the surgical procedure; and it becomes a distinct menace if through the mechanical contrivance the maintenance of the infection is furthered.

Doctor Smith has well re-emphasized the important sermons that the dental profession has repeatedly preached on this subject of the relation of oral infections to systemic disease. My remarks to you tonight are justified only by the fact that what your own men have taught has not yet become a matter universally recognized by all the members of the dental profession, and by the further fact that the teachings of dentists and certain medical men in this field have rested solely upon clinical observation. This has allowed a doubt to remain in the minds of some members of the medical and dental professions which is now entirely removed through the striking researches and the unequivocal results obtained by modern laboratory workers.

Doctor Smith objects, and no doubt with some justice, to what he calls the alarming way in which I wade into certain technical aspects of modern dentistry. I can only justify what I have said by pointing out that the dentistry which I have seen in patients is of a type which in its end results does not fulfill the hopes and claims of many a dental technician. I must still insist that if a certain procedure is wrong in principle when invoked for surgical purposes anywhere in the body, it must be equally wrong when the attempt is made to fit it to the special problem of the teeth. I recognize, of course, that under certain circumstances a tooth must be devitalized and that after such devitalization the tooth may do service for many years. I do not object to this. I only ask when such procedures are carried out that the probable consequences be kept in mind and that if systemic disease develops in such patients that the disease-giving possibilities of devitalized teeth be remembered. I recognize also that many a deep infection in a tooth can be killed with strong antiseptics and that after the use of such strong antiseptics the tooth may be worn with greater safety than before. A sterile sequestrum is, of course, better than an infected one. We all admit that. But this does not change the force of a warning against the possible dangers inherent in every sequestrum and a sequestrum is what, in major part, a devitalized tooth is. I am not arguing against the use of all powerful antiseptics as such, nor do I deny their good effects in overcoming certain infections in the teeth. I have simply asked that they be not used blindly, for these antiseptics kill the living tooth structures as easily as they kill bacteria, and dead tissue anywhere in the body presents a decreased resistance to subsequent possibilities of infection.

Too much stress cannot be laid, I think, upon Doctor Smith's remark concerning regeneration and repair in different portions of the teeth when injured mechanically or through the action of bacteria. This represents to me a field where the dentist ought to bring us much light. It seems to me that many a tooth might be treated for a season in a less radical way than is now the custom. Instead of trying to remove all of an infectious process in the tooth it seems to me that it would be well to enlarge considerably the methods of dental procedure already followed by many of our colleagues, whereby temporary fillings of various types are put in the tooth and then after a certain amount of regeneration and proliferation has occurred under these fillings, the temporary fillings are removed and the new-formed tissues are used as a better foundation on which to place restorative materials.

The point made by Doctor Smith that a tooth is frequently infected through the blood stream and not from without, in other words, that it may itself become the point in which an infectious embolus lodges, is unquestionably true. I did not deal with this question because the common origin of infections of the teeth is from without and it lulls us into a sense of non-responsibility if we stress too heavily the origin of infections through points beyond our control.

Perhaps Doctor Smith is correct in saying that I have made some poor drawings of the teeth and certain dental procedures. I recognize, of course, that a crown may be carried just to the gingival margin and that if it is well fastened there a very good crown effect may be produced without irritation to the gum or the pericementum. A crown so fitted has in essence the virtues of the half crown in that it does not through pressure kill living tooth tissue. But granting all this, I must add that practically none of the dental work that I see satisfies in practice the conditions outlined by Dr. Smith. The crowns are forced lower than they should be, or something equally disastrous is done, for as I have already said, I have not in my whole experience with patients seen a dozen crowns in which the crown line did not show evidences of pus.

The question of extracting teeth, when acutely infected, as when abscessed, is also a matter which must be answered on the basis of what we hold to be correct surgical principles. It is at present the recognized rule to open every abscess as soon as possible. I do not see why this principle should be changed just because the abscess happens to occur about a tooth. A little more care needs, perhaps, to be exercised in the case of the teeth than when the abscess occurs in some other portion of the body, because the trauma consequent upon tooth extraction is rather great. As I have emphasized before, traumatized tissues are exceedingly susceptible to infection. This is where, I think, the debate about tooth extraction in the stage of acute abscess or acute infection has taken origin. It is not that the extraction of the tooth was wrong, but that the trauma incident thereto was so great that further spread of the infection was invited. In the hands of careful men I am of the opinion that such teeth should be extracted, especially when the infection originates, as it does so frequently, from the tip of a root. The canal left by the extracted tooth then forms an excellent opening through which the infected material may be discharged. In addition to producing undue trauma, I think dentists are negligent in the after-care they give patients for whom they have made extractions. The patients should be taught how to keep their mouths clean and should be seen by the dentists, who can do much to aid drainage and by surgical methods aid the clearing up of traumatized tissues, infected sockets, etc. Patients for whom extractions have been made should not simply be sent home to get over their infections and their, at times, fractured jaws as best they can by themselves. It is this neglect of the rudiments of surgery that to my mind gives rise to the evil consequences so frequently observed.

Doctor Lange's remarks giving the Roentgenologist's view regarding infections of and about the teeth and systemic lesions are very much to the point. It is certainly true that X-ray plates should never be made of joints, of conditions indicative of gastric ulcer, etc., without consideration at the same time of the necessity of photographing also the teeth, for a mere diagnosis of gastric or duodenal ulcer, of gallstones, or appendicitis, etc., is in this day and generation most incomplete. Doctor Lange's remarks concerning the dentine deserve consideration. The fact that fractured roots and fractured teeth must always be extracted, does not, to my mind, prove that the teeth are dead structures, but rather that their powers of regeneration are very small. It does not prove the central nervous system dead because injury to it is practically permanent; this only means that practically no regeneration follows injury to nerve cells and nerve trunks. After Doctor Lange's remarks to us the dentists are going to be more interested in the constitutional symptoms of which a patient complains; and medical men are really going to learn, as our colleague has wittily put it here tonight, that the oral cavity is a part of the gastro-intestinal tract.

Doctor Doughty's remarks, too, will bring home to us anew that dentistry is legitimately only a specialty in medicine. In the course of a quarter century the dentists and medical men have strayed away, far away, from each other. It is time we got together again for the problems and the principles of our practice are identical. I shall be glad when the day comes in which dentists will be educated as medical men are today, first in the principles of general medicine and then in those of the particular field which makes of us an internist, an orthopedist, an aurist or a stomatologist.

I sympathize thoroughly with Doctor Schott's complaint that many a doctor has laid upon the back of the dental profession burdens which never belonged to it. On the other hand, I know from personal experience that the dental profession has not listened willingly to many a just demand for more radical methods in handling mouth infections. An evening of free discussion such as this brings out these facts and we go home after it, I am sure, as better friends because we understand each other better.

I am glad that Doctor Clawson is able to report such splendid results following treatment of infected and abscessed teeth by devitalization and crowning. I have never seen such, but I am always glad to be convinced in these matters and shall avail myself of the opportunity to see the patient to whom Doctor Clawson refers.

I do not pretend to be able to answer Doctor Rauh's question. There is contained in it the real kernel of the dental practice of the future. Where infected teeth, even in the young, are definitely the cause of systemic disturbance and the amount or the position of such infection is beyond our reach, I do not see how we can avoid extraction. As Doctor Rauh puts it, we are between the devil and the deep sea. It is in such a case no longer a debate between the merits of saving and of losing certain teeth, but that of saving the teeth and maintaining an infection and the losing of those teeth with definite eradication of the infection, to the end that the general health of the patient may not be impaired. As I said before, I think that we need to learn more regarding the powers of regeneration in teeth. With less radical methods in the first handling of infected teeth, with adequate use of the principles of drainage in and about the teeth, with temporary fillings to give protection to diseased teeth until we have obtained a maximum of healing and regeneration, and then the use of more radical methods for the cleaning up of infection and the employment of more permanent fillings to save as much of healthy and living tooth structure as nature may have spared, these, I think, are going to be the principles to guide us.

I have often been called a radical and some of you have been kind enough to suggest that I am such tonight, but I insist that I am really a conservative. I feel in this whole tooth question exactly as I feel in another problem that I am interested in, that of eugenics. I am not half so strong an advocate of how to get the superman, although that is a most important problem, as I am of the elimination of the known unfit. The unfit are growing in our community at such a rate that in fifty years they have about doubled, and I am interested in the ways and means of removing from the shoulders of the rest the immense burden of these known unfit. That is the way I feel about the teeth. I am not interested in eliminating pretty good teeth or anything of the sort; I am just interested in eliminating what we know to be bad, and what we all agree on as bad.

I want to thank you again for your generous courtesy to me.

A good time to stop talking is just before you have told all you know.

The most complete repair kit won't mend a broken promise.

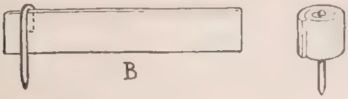
A SOLDERING BLOCK AND ACCESSORIES.

BY R. M. WEBER, D.D.S., KANSAS CITY, MO.

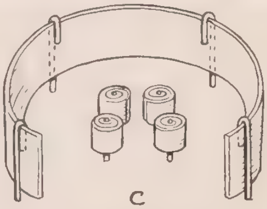
The best soldering block that I have been enabled to obtain is one that is sold at the jeweler's supply houses, represented by Fig. A. It is a metal cap enclosing a rather dense roll of asbestos paper and possesses the advantage of allowing supports to be inserted to hold your work in any position desired.

Fig. B shows how asbestos covered supports may be made. Bend a piece of brass or copper wire, closing onto a piece of asbestos paper, (the desired width and length,) then moisten and roll. When this is subjected to a drying out, you will have a very substantial support, one that will help retain heat and may be used quite a number of times before it starts to crumble.

An additional means of retaining heat is represented by Fig. C. This is merely a strip of asbestos cut the desired width and length, placed and held in the position desired by using the wire pins prepared the same as those used in making the supports.



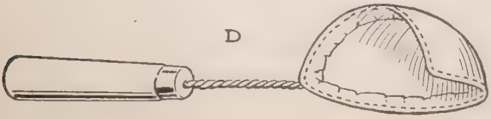
B



C

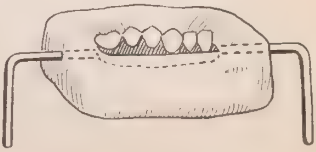
In soldering as it is ordinarily done, at least 50 per cent. of the heat is lost by being deflected, means not being used to confine it. To prevent or at least minimize this loss, prepare a shield as represented in Fig. D.

At the Ten-Cent Store, you can obtain a sieve on a circular metal frame with a wooden handle, the circular portion being 4½ inches in diameter, the best size for this purpose.



D

Fig E



Remove the sieve and bend a little less than half of the circular portion back and up, this when covered and used gives you the same effect as that of a hand being held over a light, such as a candle or match, to protect it from being blown out.

Cover this with asbestos paper by placing over the sieve in such a manner that you will be able to mold the wet asbestos to the shape desired leaving enough excess (when the paper is cut) to be folded over and pressed back on the portion covering the frame.

When this is done, dry over a burner or by throwing on a brush flame, using blow pipe, and you will have a shield to be used to confine your heat, when soldering, and it will be serviceable for quite a while before it need be re-covered.

Another advantage, when investing any metal bar along with any extensive case for soldering to aid in prevention of shrinkage and to hold case firmly, let the ends of the metal bar extend out of the case, (see Fig.D). These can subsequently be bent at any angle and inserted in this soldering block, wrapping exposed metal with wet asbestos paper.

DENTAL CARIES*

BY W. A. CHAMBERLAIN, D.D.S., ST. LOUIS, MO.

OF ALL THE RESEARCH WORK done up to and during the lifetime of Dr. W. D. Miller, his work on the subject of dental caries still stands as meeting all the scientific requirements of the dental profession, on how caries occurs. And of all the work which has been done since in continuation of his work, many theories have been advanced only to be overthrown later. However, to one who has followed the literature closely, one thing very noticeable is the trend of thought which some of the work is taking toward the belief that dental caries is not alone a result of local causes, but has also some systemic predisposing cause. Some investigators have believed that the systemic cause takes the form of a carbohydrate such as glycogen, in the saliva while others have thought that some morbid systemic condition produces a mucous secretion which is also high in carbohydrate properties. Mucus plays an important part in dental caries from the standpoint of both local and systemic causes.

There was a great deal of interest taken in the theory advanced a few years ago that the presence of potassium sulfocyanate in the saliva produced immunity. Able dentists and chemists investigated and so sure were they that pharmaceutical manufacturers were encouraged to put a potassium sulfocyanate tablet on the market.

The dentist, before prescribing this, would obtain a sample of saliva from his patient, test it with ferric chloride for K. C. N. S., which, if present, would give a red color. If not present, these tablets would be administered and within a few hours K. C. N. S. began to show in the saliva. It was considered a dangerous drug to administer, but no doubt if it had accomplished its mission the technic would have been developed so that any dentist could give it or possibly patients would be sent to specialists for treatment. Further study and investigation convinced everybody that its presence or absence had no value whatever in producing immunity. It was considered a waste product of proteid metabolism. Nevertheless, the theory was an interesting one.

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*Read before the St. Louis Society of Dental Science.

Working out Doctor Black's investigation regarding plaque formation which was that of poisoning a solution containing lactic acid germs which were acting in the presence of a carbohydrate, the germs became enervated, so to speak, and elaborated a thick gelatinous substance as a self preservation measure and attached themselves to whatever hard substance was near. This experiment was performed in the test tube with oil of cassia or phenol as the enervating agent. Now if K. C. N. S. was added the effect (supposedly) was to raise the vitality of the germ to such a point that it floated around free as a harmless invader instead of elaborating the gelatinous substance.

The latest ideas along the line of systemic condition affecting dental caries are on the ductless glands or internal secretion. It is claimed they control calcium metabolism, thereby affecting tooth structure. In addition to this matter of calcium metabolism, Doctor Kirk believes that a disturbance or irritation of the pituitary body causes glycogen to be secreted in the saliva.

During the latter years of Doctor Miller's life he was giving his attention to immunity and susceptibility, for he had observed that although he had explained how dental caries occurred, he had not explained why. That is, why some people whose mouths were unclean did not develop caries while others, whose mouths were clean and teeth well brushed, did. No doubt, had he lived a few years longer his wonderful mind eventually would have solved the problem. He seemed to think the reason a local one and a matter of diet, for he expressed the opinion that if the diet were of a proteid nature there would be very little decay.

Doctor Pickerill, of Otago, New Zealand, has done an enormous amount of work and in his recently published book deals with decay from a local standpoint.

What the eventual conclusions will be as to systemic predisposing causes or local causes only time can tell, but one thing is sure, the matter of immunity and susceptibility is going to keep men investigating until definite and positive conclusions are obtained.

Doctor Miller proved scientifically that the active cause of caries was produced by the decalcification of tooth structure by lactic acid, the product of a germ acting in the presence of a carbohydrate, and through the protection of a gelatinous plaque.

There has been much work done on the production of the plaque and what the plaque is composed of, though all agree that its formation is strictly of a local nature.

Some have tried to prove it is a result of bacterial action of another germ by showing that there are many slime producing germs. Those who oppose this idea admit there are many slime producing germs, but say the best producers are not found in the oral cavity. Another idea which has been mentioned was that the lactic acid germ under unfavorable conditions threw out a gummy substance and attached itself to the tooth as a means of self preservation and under this plaque lived and produced the acid which attacked the calcium salts. Still another well-accepted theory is that the free lactic acid produced in the mouth by carbohydrate fermentation precipitates mucin which attaches itself to the teeth, enmeshing the germs. In whatever way the plaques are formed they are found in sheltered places and serve the purpose of a protection for the germ. They also hold the lactic acid in contact with the tooth as well as entangling carbohydrate material for the germ growth.

As is known, the germ needs moisture, warmth and a medium in which to grow. If, as some think, there is in addition to the food ingested by the individual a highly fermentable carbohydrate ingredient in the saliva due to some constitutional cause or a high carbohydrate property to the mucin, due to some morbid systemic condition, there is then an ample carbohydrate medium for germ growth.

After the enamel rods are separated by the dissolving of the cement substance which bind them together, they drop out. This in turn gives an opening for the formation of more germ growth. When they reach the dentin there is another germ which works as an ally of the lactic germ by bringing about a peptonizing of the proteid substance of the dentinal tubules. An interesting thing to note in this connection is that destruction of tooth structure does not come from a putrescent root canal, which is because of its proteid contents.

The late Doctor Michaels, of Paris, France, has called attention to experiments he has made showing glycogen in the saliva of susceptibles. Glycogen is formed in the liver by carbohydrate metabolism and where the consumption is excessive it shows in the saliva.

Doctor Kirk has taken up this work and has emphasized the fact that because glycogen is highly fermentable it is conducive to decay and in this case believes the condition can be corrected by dietetic treatment.

Doctor Bunting, of Ann Arbor, has also called attention to this condition.

Doctor Kirk has explained another systemic cause for glycogen in the saliva which is due to a disturbance or irritation of the pituitary body through what is known as pathological dentition both of the deciduous and permanent teeth. This comes about by reflex irritation.

This matter of internal secretion in its relation to dentistry is new as well as very interesting and the hope is that it will furnish some solution to the problems of decay.

In general, the secretions of the pituitary body control body and bone growth. The adrenals control carbohydrate metabolism and the parathyroids calcium metabolism. However, these glands, including the thyroids, work in a cycle, stimulating and controlling each other. The ones which are most interesting in connection with this paper are the parathyroid glands. They are small glands located over and posterior to the thyroids. When they are destroyed entirely, death follows unless calcium salts are administered.

In considering this phase of internal secretion some credence must be given to relation of tooth structure to decay. Doctor Black has told us that decay is not a matter of tooth structure but of tooth environment, and the idea has been generally accepted by the dental profession. However, he says also that teeth decay where they are habitually unclean and in structural defects, so that no doubt tooth structure plays some part after all. If a faulty calcium metabolism produces a structurally defective tooth, it will be more susceptible than a better formed one.

Some writers have stated that a defect in the secretion of these glands produces an osteo-malacia and a hyperplasia of the enamel and dentin. I quote from a recent article as follows: "Many of the glands which have an internal secretion, the thyroids, and parathyroids, the ovaries and testicles, the pituitary and the thymus, in infancy and childhood, seem to take in normal bone metabolism. The calcium in the blood has been found to be the highest in the child; it decreases slowly with age, being higher in breast-fed than in artificially-fed children, who seem to retain calcium longer and store it * * * and coagulation of blood will not occur except when calcium salts are present." Ott says, "Bones (and we might add teeth) are chiefly composed of 90% calcic phosphate and carbonate (meaning of course the inorganic content). These are the alkali stores in bone; when the quantity of alkali decreases these insoluble calcium salts become soluble. In the period of growth of the young there is great breaking up of nuclear substance, forming nucleinic and phosphoric acid, which may circulate in the blood, dissolving the calcium salts and causing an acidoses.

Doctor Pickerill has given a great deal of study to saliva and considers it the immunizing agent against decay by virtue of its alkalinity. He has studied the different stimuli of saliva and finds its alkalinity governed accordingly. Pain such as that produced in excavating a cavity produces an abundant flow but of a low alkalinity and largely water. Alkalies produce very little secretion and of a low alkalinity, while acids produce an abundant flow of high alkalinity. Some acids produce a higher alkalinity than others and he found those to be fruit acids. His conclusions on the study of saliva are:

1. It is evident that the saliva is a fluid extremely variable in its composition and amount, but that these variations do not occur without reason, but rather in obedience to fixed and definite laws and in response to certain ascertainable stimuli.

2. The mechanism controlling salivary secretion is extremely sensitive and complex, since different "flavors" of little intensity are capable of being "selected," and give rise to secretions of saliva differing widely in character and amount.

3. That practically all the normal constituents of saliva are, if present in sufficient amount, of value and importance in protecting the teeth against the occurrence of dental caries, and in maintaining the health of the oral mucous membrane.

4. That acids, and particularly the "natural" organic acids, are the stimulants which excite the greatest amount of these protective substances per minute, and moreover, give rise immediately, and for a considerable time afterwards, to an increased alkalinity of the mouth. That, conversely, substances of little or no distinctive "flavor," and also alkalies, produce a diminution in the amount of protective substances per minute, and reduce the alkalinity of the mouth both at once and for some time afterwards.

5. That in the saliva is provided a natural and potentially perfect mouth-wash, acting continuously day and night (not merely for a few minutes a day). That it is, moreover, completely under control; that it may be altered or varied in amount or composition; that its beneficial effects may be increased or decreased absolutely at will.

He suggests starting and ending a meal with an acid fruit and also prescribes several mouth-washes, one of which is the following:

Acid potassium tartrate	gr. ii
Tartaric acid	gr. i
Oil lemon	M iii
Saccharine	gr. ¼
Water	ad. ℥i

As is noticed, it has no antiseptic properties in itself but resembles fruit acid and serves the purpose of an alkaline salivary stimulant.

Doctor Pickerill has given the same amount of study to mucus that he has to saliva. He finds that sugar stimulates the flow of mucus and where the consumption is excessive hypertrophy of the buccal mucus glands occurs. He agrees with Kirk on the formation of plaques by a precipitation of mucin by an acid.

Alkalies are solvents for mucin and where the mouth is bathed constantly in an alkaline saliva the mucus as well as the plaques themselves are going to be washed away.

Eventually, how much of the local theory and how much of the systemic theory will enter into tooth decay? And even then how much will it enable us to stop dental caries unless the treatment can be given without disturbing or changing the habit of the individual?

Not in the clamor of the crowded street,
Not in the shouts and plaudits of the throng,
But in ourselves are triumph and defeat.
—*Longfellow*

A METHOD OF OBTAINING DENTAL SERVICE IN HOSPITALS BY THE APPOINTMENT OF INTERNS*

BY HERBERT L. WHEELER, D.D.S., NEW YORK

IN 1901 AND 1902, the first dental department of a clinic or hospital in New York City was established in St. Bartholomew's Clinic at 215 East Forty-second street. This has had a continuous existence up to the present time. The organization and direction of the dental service was carried on by Dr. J. Morgan Howe.

Shortly after this Dr. John W. Brannan, the president of the Board of Trustees of Bellevue and Allied Hospitals, suggested the establishing of a dental service in Bellevue Hospital. This seemed a good suggestion. In the first place, it appeared that a weak point in the chain of resistance to the inroads of disease was the lack of intelligent care of the mouth and teeth, and the opportunity to be associated with this great emergency hospital offered excellent conditions for putting into execution plans which might show that no satisfactory attempt could be made at prevention of disease without considering and including the oral cavity and its contents. With the co-operation and assistance of Doctor Brannan, we set about securing a staff for Bellevue Hospital. In arranging for a permanent dental staff we tried as far as possible to avoid the conditions that seemed sure to arise, and did arise within a short period. The dental profession was divided into two camps: those who favored all dental service of this type being paid for by some one, either the city, institution, or through charitable donations, and those who favored the dentists giving their services as the physicians did. It seems probable that those who favor the payment of the dentist for his services in this charitable work are largely in excess of those who do not; and feeling that this question would arise sooner or later, we endeavored to steer a middle course.

Our plan was as follows: In hospitals in which physicians gave their services the dentists should do likewise, but in turn the dentist should receive due recognition and be appointed on the same basis and with practically the same title as the physician in a corresponding department in medicine or surgery. The dentists had their titles conferred as in the surgical and medical departments. For instance, there was a director of the dental service at Bellevue. There was created a staff of visiting dentists, who represented the older and more experienced men, and a staff of assistant visiting dentists, who represented the younger class more recently graduated; and these were appointed with the understanding that they serve a specific time, weekly or monthly. It is usual for the visiting dentists to come every two weeks or once a month, and for the assistant visiting dentists to serve one or more afternoons per week; besides this, there was eventually, after two years or so of experiment, established a dental intern who lives at the hospital, associates with the medical and surgical interns, and is retained on exactly the same conditions as the other interns, receiving a certificate at the end of his service.

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*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the Jour. Amer. Med. Asso.

I have had those interested in other hospitals approach me in regard to establishing dental departments for them, but with the exception of Bellevue, I have not found those who were willing to give a man the full honor and position due him unless he had the M.D. as well as the D.D.S. This attitude would prevent dental service in most hospitals.

The plan adopted at Bellevue was extended to the Allied Hospitals, one by one; first to Harlem, then to Fordham, then to Gouverneur, with the exception that up to the present time there has not been an intern appointed at any of these Allied Hospitals. Gouverneur is, however, at present actively engaged in the attempt to secure an intern. It seems probable from our experience at Bellevue that the addition of an intern to the other hospital staffs will double, or more than double, the efficiency and quantity of service that can be obtained from a dental staff in a given time. . This is due to the fact that there is somebody at the hospital at all times, not only to attend to emergency cases as they come in, but also to arrange and so distribute the work that there is a greater conservation of time and less waste in waiting and arranging for various things. Last, but not least, in this plan of service is the question of a nurse assigned to the dental department.

At the original inception of the dental service, social service nurses, who were under no particular authority, were furnished, but this proved decidedly unsatisfactory and undesirable. Later, one of the regular nurses in the hospital was appointed to serve in this department. Practically all of the regular nurses who have served have been deeply interested in the work, and they are enthusiastic, with the result not only that their service in the department of cleaning instruments, caring for the patients, sterilizing implements and arranging supplies has been of the very greatest assistance, but also that their assistance in obtaining patients from the wards with the least expenditure of time, and the keeping of the accounts and records has been of such a character as to entitle the nurses to a good share of the credit for the success of the dental service.

To establish and obtain a successful dental service in an organized public or private hospital the following things are necessary: the dentists must be men willing to sacrifice some of their time in public service and who have a sincere belief in the usefulness and beneficence of their work. They must be regular in their service. The managers or board of directors of the institution must be in sympathy with the work, willing to assist in every way possible and willing to overlook the many shortcomings that are bound to develop on the part of the dentists from lack of experience.

There should be also general medical directors or superintendents who are sympathetic with and desirous of using the dental service to the limit of its possibilities for the welfare and upbuilding of the hospital.

An idea of the value of the dental service to Bellevue may be given in instances of record. The service is arranged so that those who shall be first received are the children of the various wards; and it is within the province of the dental department to retain the patients in the hospital until such service as they deem necessary shall have been obtained by the patient. There are at present on the staff of Bellevue and Allied Hospitals no less than twenty-eight or thirty dentists. A goodly part of these serve comparatively regularly, as may be seen from the following report of the services rendered last year:

At Bellevue Hospital there was given, in time, by the staff, 1,998—practically 2,000 hours. There were attended to in this one hospital alone by the dental department 1,161 children and 1,142 adults. There were performed altogether, including major and minor operations, which run from mere treating of a carious tooth with an inflamed pulp to operations for necrosis and carious bone, and the setting of fractured mandibles—5,956 operations. In Harlem Hospital, where the work is carried on entirely by a staff of women dentists, in charge of a woman dentist, there were 231 children attended to and 19 adults. The operations here represented something over 600. At Fordham Hospital, where the staff is comparatively small, there were 154 children attended to and 78 adults. The number of hours put in by this staff was 141, and there were performed a total of 874 operations. The dental service at Gouverneur had not been organized fully a year at the time of this report, December 31, 1913—and yet here, with a comparatively small staff, there had been attended to altogether 451 individuals, and there had been performed, from April 1st to December 31st, 700 operations—a pretty good service for part of a year.

As an economic proposition, let us see what Bellevue has accomplished in one department only of the dental service as a money saver for the city of New York. Fractures of the jaw, and major treatments of this kind, run about 100 per year in the dental service. Previously all fractures had to be sent elsewhere or else put in the ward and the patients bandaged; there had to be a nurse in regular attendance and the patient had to be cared for, housed and fed for a period extending from five to ten weeks. One may estimate for oneself the cost per patient to the city under these conditions. After the establishment of the dental service there was equipped a dental laboratory sufficiently complete to make vulcanite and metal splints for fracture cases and for doing various other mechanical things that might be demanded in the dental service of any well-equipped office. When patients are sent to Bellevue now with a fractured jaw, they are, as soon as possible, taken to the dental department, an impression is taken and a splint is made and placed in the mouth. This can usually be done in from one to three days. As soon as the splint is in place, if the injuries are not such as to make it impossible for the patient to go about his usual vocation, he is permitted to return to his occupation at once, coming back to the hospital two or three or four times a week for observation and cleansing. The difference between keeping a patient from five to ten weeks, with a nurse in constant attendance, and keeping one three or four days and allowing him to leave, in the matter of expense, is very great, and the economy must be credited to the dental department. I venture to say that the city of New York has been saved considerably more on its fracture cases alone by the dental department than the entire dental service has cost from the beginning to the present time, to say nothing of the improved conditions that have obtained for the patient and the amount that has been saved to patients because of their ability to return to their occupations within a very few days. Add to this the probable certainty that the dentist will set a fractured jaw so that there will be a proper occlusion after the bone has healed, and you have a very simple but strong argument in favor of the establishment of dental service in a hospital. But this subject would require a paper in itself and I will confine myself to the executive part of the work.

I think that the foregoing statement has shown that if the dentist is given due consideration and authority equal to the responsibility placed on him, it is not impossible to establish a useful and successful dental service in a general or emergency hospital.

There are of course conditions and circumstances which make it impracticable to obtain dental service on this basis, and there are arguments on the side of the men who advocate that dentists shall be paid for their service wherever it is rendered, by somebody or in some way, and experience leads me to believe that circumstances alter cases and that one has to use judgment as to which of these methods one will apply to a given case. At Bellevue and Allied Hospitals the methods described have worked out extremely well. I do not consider that the dentist as yet realizes the necessity of being responsible and regular in his service to the extent that he should, but conditions are improving in this direction.

At St. Bartholomew's it was impossible to get a dental staff on any other than a paying basis. Even then, under the direction of a man who was not recognized by the dental profession, the service gradually ran down and became a failure. Later the service had to be reorganized, and it was found necessary to continue the practice which had been established of paying for the dental service. The payments are not high; in fact, they are ridiculously small, but they are sufficient to assist young men who are anxious to spend part of their time in establishing a practice and willing to spend the other part to secure enough to give them a small income as a certainty. Therefore it is not hard work to secure a fairly high class of young men in this service.

If a salary is paid, we can demand certain hours, that the dentist practice along the lines that those in authority wish, and closer supervision and a greater authority can be exercised. The result is that the work can be greatly expedited and the energies utilized may be and are greatly conserved. Although comparisons are invidious and often misleading, the following will show what I mean:

At Bellevue, the intern may be said, in a sense, to receive at least some return for his services. None of the visiting or assistant visiting dentists, or the director of the service, receives anything, so that if a man feels, for any reason, that it is impossible for him to be at the hospital at the time he is supposed to be, without much compunction he fails to appear. It requires considerable effort sometimes to impress on them the necessity of appearing regularly. Patients are often brought into the dental department ready for dental service, only to find that the expected assistant visiting dentist does not appear. This is annoying to everybody, besides being a great waste of energy, and costing in loss of time and inconvenience.

At Bellevue, with a staff of twelve, it has been pointed out, the operations performed last year totaled 5,956, which is without doubt an unusually good showing, as evidenced by the number of hours, practically 2,000, which were put in by the staff of Bellevue Hospital alone.

At St. Bartholomew's clinic, with but two men on the staff besides the director, who does no work at the chair, one working every afternoon from 2:00 until 5:00, and one two evenings a week, they attended to 5,009 persons and performed over 7,500 operations. This was because the men had to be there, furnish a substitute or lose their salary, which acts as a strong incentive to keep a man at his work. I am satisfied with both methods that have been described, and believe that, with discretion, either may be used successfully.

I have frankly told those desiring to establish dental service in a hospital, who were unwilling to appoint dentists on the same basis and give them the same standing as the medical attendants, that I saw no other way but to pay a salary. I myself would advise any dentist against serving in a hospital where his recognition was not as complete as that of physician, unless he serves for pay, and that is his own affair. I am not sure but that a small stipend or salary paid to a man (and this would perhaps hold good in the medical and surgical departments) would enable us sufficiently to control those giving the service, so that the work might be directed in a way to save time. It is not impossible that this might serve to make it cheaper in the long run to have a paid service.

This is not intended as an argument either way on this subject. It is a matter that will have to be worked out by experience. I am, however, of the opinion that whether or not it be a paid service, some method whereby it is possible to insist on men's serving the time they say they will is essential in order to obtain the most efficient and desirable results.

560 Fifth Ave.

ABSTRACT OF DISCUSSION

Dr. W. C. Fisher, New York: This paper proves conclusively what I contended two years ago was necessary in order to get proper dental service in hospitals. Doctor Flanagan, of Springfield, Mass., read a short paper before this Association in 1912 on the need of a dental staff attached to hospitals, and in the discussion the question was constantly asked, how could this best be accomplished? Doctor Brown, of Milwaukee, did not believe proper services could be obtained in a hospital of any size except through internships, and that dental service should be paid for the same as medical service is paid for; that the real work of the hospital was done by men attached to that hospital, under the supervision of more experienced men, and that the dental intern should be there constantly also.

Dr. R. H. Ivy, Philadelphia: In 1900, an oral surgical staff was appointed at the Philadelphia General Hospital. There were four men appointed, two of whom held the dental degree, the other two both medical and dental degrees, and they were all received on equal footing with the medical members of the staff of the hospital. One year later, in 1901, two interns were appointed in that hospital on an equal footing with the other interns of the hospital and under the direction of the visiting staff, and it was decided at a meeting of the medical staff that all cases of mouth conditions and many cases in which the mouth was responsible for the general condition, should be turned over to them for treatment. This plan worked so well that there have been two dental interns on the hospital staff continuously since that time, the dental men working always in harmony with the medical men and belonging to the society of the residents of the hospital. This year the same plan is being carried out in the Episcopal Hospital. A resident dental surgeon on an equal footing in every way with the medical residents has been appointed and has been given a splendid equipment to perform all kinds of dental and oral surgical operations. It is now being contemplated to increase the number of dental interns in the Philadelphia Hospital so as to have two on duty to care exclusively for the tuberculous patients, it being deemed desirable to keep these patients separate from the others in regard to dental treatment.

Dr. M H. Cryer, Philadelphia: I would like to add to what Doctor Ivy has said, that the four members who form the oral surgical staff give clinics for eight months in the year on Saturdays, and they for some reason have the largest clinics given in the city of Philadelphia. The average attendance for the past winter from the various dental and medical schools was 350. On some occasions we had as many as 450 students and practitioners at these clinics. The city of Philadelphia also gives a certificate to those who attend 80 per cent. of the clinics, and these certificates are signed by the oral surgical staff, the Director of Public Health and Charities. and the city seal of Philadelphia is placed on the certificates. These certificates have become so popular in foreign countries that they stand higher today than the university degree, because they are signed by an official of the city and bear the seal of the city. When a graduate goes to a European country, he is asked where he has attended his lectures and what degrees he has. When he answers that he has the University degree, the Philadelphia Dental College degree, or the Medico-Chirurgical College degree, they ask, "Have you a certificate from the Philadelphia General Hospital? We consider that better than any other degree." That is what we have been doing in Philadelphia since 1900.

The dental interns in the Philadelphia General Hospital (Blockley) are appointed in this way: At the clinics and lectures announcement is made that two interns will be appointed each year, and that Doctor Roe, Doctor Russell and myself will be glad to receive applications from students wishing these positions. The students making application are especially watched during the senior year of their course. These men are required to make a certain class of splints and do other operations up to a certain standard, after which they are passed on by the faculty of one of the three schools, and then passed by the state board. Then the applications are gone over by Doctor Roe, Doctor Russell and myself and we decide which men we will appoint as interns. They are then recommended to the Director of Public Health of the city and he makes the appointments. These men serve one year, and if their service is satisfactory and they wish to continue, they are allowed to serve another year. The dental interns belong to the Intern Society which has been in existence for many years, and they are received on an equality with the medical interns, and the oral surgical staff members belong to the medical board of the hospital. This has been going on since 1900, and the plan has been adopted by other countries—France, Italy, Spain and others—and in 1904 the government of Spain sent Doctor Aguilar to Philadelphia especially to see what we were doing there in taking care of the mouths of some five thousand patients in the City Hospital.

DR. T. L. GILMER, Chicago: I have been a member of the medical board of St. Luke's Hospital, Chicago, for twenty years, and Doctor Black is also similarly connected with the same hospital. We are there on exactly the same basis as are the other members of the staff. We are designated as oral surgeons. I think this is a good time to work for extension of the service to include dental interns in hospital work, since it is now recognized by physicians in general that the mouth infections play an important part as a primary factor in the etiology of infections in different parts of the body. The mouth foci must be eradicated before patients can be cured of heart, joint or other lesions, which may be secondary manifestations of the mouth focus. Much of the work, especially the strictly dental part, may be done by the dental interns, relieving the oral surgeon of much of the less important service which is imposed on him at the present time.

DR. M. I. SCHAMBERG, New York: It is gratifying to hear the report of the appointment in Philadelphia of interns as a matter of priority over New York. However, in Philadelphia, you have one hospital which has interns, while in New York, through the efforts of Doctor Wheeler, we have many which have adopted the internship plan. While hearing this paper it has aroused my desire to ask for a dental intern in our institution, for the reason that I frequently request that many of the fracture cases be put through the so-called prophylactic treatment prior to treating the mouth, so as to avert, if possible, any secondary disease that may occur. In this way I believe the proportion of cases of necrosis and abscess conditions that follow fractures would be materially reduced. I feel confident that the addition of an intern in our institution will raise the efficiency of our work 100 per cent.

DR. G. V. I. BROWN, Milwaukee: I am on the surgical staff of the Children's Hospital in Milwaukee just as all the other surgeons are. We have recently had a visiting dentist appointed on the staff. In order that we might outline the work he and I have made a complete examination of the children's mouths in the hospital, and as simple as that may sound, we found it difficult to do, for we found it impossible for us to do it all in one day, and between visits the children would come and go. As the result of our work, the dentist has just sent in a recommendation which will call for a mouth examination as part of the regular intern's examination for each patient. For example, when the history of the case is taken, the general physical examination will include an examination of the mouth with sufficient accuracy to warrant calling in a dentist or otherwise. At least there will be a mouth record of every case the same as the physical record. There has not been any mixing of medicine and dentistry on that; we consider that it is a matter which pertains to the welfare of the patient. We found an appalling state of affairs in the hospital. We found that little patients were lying in bed for months, being treated for joint diseases when they had anywhere from one to five diseased teeth in their mouths. In view of the recent investigations and demonstrations, the importance of this will be understood. We are to blame for that as much as the surgeons; it is a question of wrong routine. In the other hospital with which I am connected I have had not had the courage to have a dentist intern appointed. I did not care to have the matter disturbed and have other questions arise which I could not meet. I am there simply as an oral surgeon. When Doctor Wheeler gets this work on the right basis, and when somebody has shown me exactly what should be the relation of the dentist in the hospital, then, of course, I want to appoint interns. In the meantime, however, I do not care to take the responsibility.

Dr. A. D. Black, Chicago: It is only necessary for a person familiar with mouth conditions to spend a few minutes in a hospital to see the necessity for this work. The greatest difficulty in establishing the work heretofore has been the lack of appreciation of the physician of it and the difficulty of placing dentists in the service on the proper basis, because we cannot get the kind of men we want to do this work under the conditions which have heretofore presented in most of the hospitals. I wish to emphasize that there has been enough published in the medical literature of the past two years, to say nothing of any other work, to have attracted the attention of every physician on every hospital staff to the importance of the mouth as they have never appreciated it before, and there should be no difficulty at present in presenting to any hospital one or the other of the plans which Doctor Wheeler has outlined and have them accept a plan and appoint dentists for the service. In St. Luke's Hospital in Chicago, as Doctor Gilmer has said, we have done many things that are not expected of us, because of the crying need for it. I know I have many times sacrificed time which I was not expected to give because of the need for dental service among the patients and because under the hospital arrangement there was no other way to get the service. There is another feature to this work that I would like to speak of, and that is that there is opportunity in the establishment of these internships in hospitals for the dental profession to get credit for the service or to be embarrassed by the service given, in accordance with the type of men who are selected for this service. We need to be extremely careful of the men we put in because the contact with the medical men and the patients in that service is of tremendous importance. We have the opportunity there to impress on them the value of this dental service as we have in no other way.

Dr. T. F. Tholen, Los Angeles: In the Los Angeles County Hospital we have an oral surgeon who visits the hospital and who confers with the men in the surgical section as to the treatment of oral surgical cases. We have had very good results from this method, but Doctor Wheeler's method seems to be so much better that I think I will do what I can to induce them to introduce his method.

Dr. E. A. Bogue, New York: It does not seem to have been recognized by the medical world at large until lately that the mouth and nose, which are connected by one passage, constitute the entrance for all that we take in to support life, and almost all that we take in to destroy it, and that the condition of the teeth has much to do with the general health. It seems to me that Doctor Wheeler has pretty nearly put us on the track of developing our section and placing it in its proper position in the medical world. I hope he will persevere until all of our hospitals establish the intern system for dental practitioners. As I understand it, all these interns have to be graduates?

Doctor Wheeler: At present they not only have to be graduates, but also have to pass the state board.

Doctor Bogue: In England there is a practice of extracting all temporary teeth, if one happens to be bad enough to come out, but we are rapidly getting away from such practices. In several of the European countries the governments are appointing dentists to take care of the teeth of the children, and in this country, the Forsyth Infirmary, in Boston, of which you all know, is doing an enormous amount of work in the way of caring for the teeth of the poor children of the city.

Dr. H. L. Wheeler, New York: There is just one way to get dental service in the children's hospital, and that is to appoint dental interns and let them live there with the medical interns. The service cannot be had in any other way, unless it is paid for, and if this scheme is adopted trouble arises because the medical men also want to be paid.

This subject in New York City has had a good deal of discussion, not only in the profession but by the laity, and only recently the committee of the Board of Estimate and Apportionment decided to recommend that dentists be put in the same classification as medical men in every department where dentists are to be appointed. They have decided to have first class interns, both medical and dental, men who have graduated from college but who have not yet passed the state board unless they wish to. They may be appointed intern for one, one and a half, or two years, and receive a certificate from the hospital when they finish their service. They are to receive besides as spending money, $240 the first year and $360 the second year. Any man who has served as an intern for one year, or served in the dental clinic for two years, which requires of him three hours' service eack week, may be appointed to the second grade, which is known as the junior grade. The junior grade is to receive from $900 to $1,380 and is on the same basis as the physician in the Department of Health. After he has served two years in that department he may be advanced to number three grade, which starts at $1,560, to any price that he may be worth, and that is where he has an advantage over the medical man, because the medical man can only advance to the third grade. That is what we are doing in New York. The only satisfactory way to do this is to have the dental men put in the hospitals on the same basis as the medical men and use a little precaution as to who is selected for the dental staff, because one dental man who is a little too aggressive can wreck the whole thing, and the dentist who uses due discretion will make it possible to get the support of the city fathers and get the necessary means to carry on the dental service in any city. The final result of this in New York is going to be that in all clinics which are supported by the benevolently inclined public and charity organizations, these young men will be employed to go into the classified service, which is under the regulation of the city Department of Health, and that will be the only way that one can get into the classified service.

MESOTHELIAL TUMORS OF THE JAWS*

BY ROBERT H. IVY, M.D., D.D.S., PHILADELPHIA, PA.

ASSISTANT INSTRUCTOR IN SURGERY, UNIVERSITY OF PENNSYLVANIA

WITHIN THE PAST YEAR it has been my privilege to study, clinically and histologically, a considerable variety of mesoblastic neoplasms of the oral cavity. Most of these cases occurred in the oral surgical service of Dr. M. H. Cryer, to whom I am indebted for the opportunity of reporting them.

Most of the growths under consideration fall into that group known under the common term "epulis," a name meaning from its derivation "anything on the gum." An epulis may be described as a circumscribed connective-tissue growth from the alveolar ridge, which is covered over by the normal mucous membrane, except as the latter may undergo secondary ulceration due to pressure necrosis, infection, etc. (Occasionally growths clinically classified as epulis may be found to be epithelial in nature, for example, papilloma, epithelioma, etc., but these will not be considered here.) Under this broad heading, therefore, many clinical and pathologic varieties of mesoblastic tumor may be included.

The most obvious clinical characteristics of an epulis and those which

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*Read before the Section on Stomatology (A. M. A.), of which THE DENTAL SUMMARY is the representative organ for the dental profession by special arrangement with the *Journal Amer. Med Association.*

give the most reliable information as to its pathologic nature are: (*a*) consistency, and (*b*) rate of growth. Thus we have the hard epulis and the soft epulis. The hardness is in the new tissue itself. In the soft variety there may be a hard shell of bone covering a portion of the tumor, but the tumor tissue itself is soft. The hard variety of epulis is nearly always very slow in growth, and alters in size but little in months or even years. There is usually quite a sudden line of demarcation where the bulging of the new growth extends beyond the normal contour of the gum. It gives the impression of arising from the surface of the underlying alveolar process. In color, the gum tissue covering the tumor may be slightly reddened, though it generally differs but little from that of the normal gum.

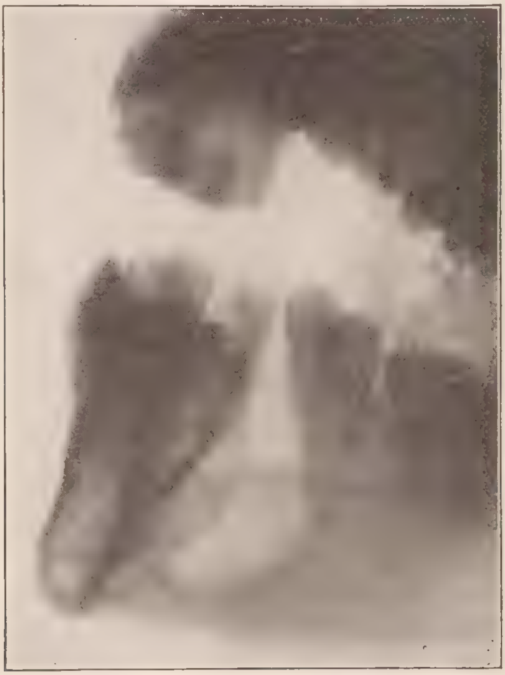

Fig. 1—Rœntgenogram showing giant-cell myeloma. (Cryer.)

The soft form of epulis, on the other hand, is usually rapid in growth, often increasing greatly in size in a few weeks. The bulging beyond the normal gum-contour, in the deeper parts of the swelling at least, generally occurs gradually while one may distinctly recognize the origin of the growth as being from the interior of the bone. A portion of the tumor may be covered by a bulging shell of bone. In color, these tumors are generally a dusky red. In this variety of neoplasm, the Roentgen ray frequently shows a space in the bone as clean-cut as though it had been drilled through with a large caliber bullet (Fig. 1). Epulic growths may be sessile or slightly pedunculated, and vary in size, occupying the space of one, two, or several teeth, which are often considerably displaced or loosened.

The two clinical types of epulic tumor present marked differences in histologic appearance.

The hard variety of epulis is fibroma pure and simple. Microscopically, we see an outer layer of normal stratified squamous epithelium and submucosa, while the deeper portion of the growth consists of an interlacing network of fibrous tissue (Fig. 2). Occasionally there is evidence of myxomatous degeneration, and sometimes of bone formation. These growths spring from the periosteum lining of the alveoli.

The soft epulic tumors are generally grouped pathologically under the giant-cell sarcomas or myelomas. Histologically, beneath the covering mucous membrane there is a stroma of fibrocellular tissue resembling fibrosarcoma. Scattered throughout are the giant cells, which vary in size and have numerous nuclei grouped toward the center of the cell. Small masses of bone and cartilage may be found (Fig. 2).

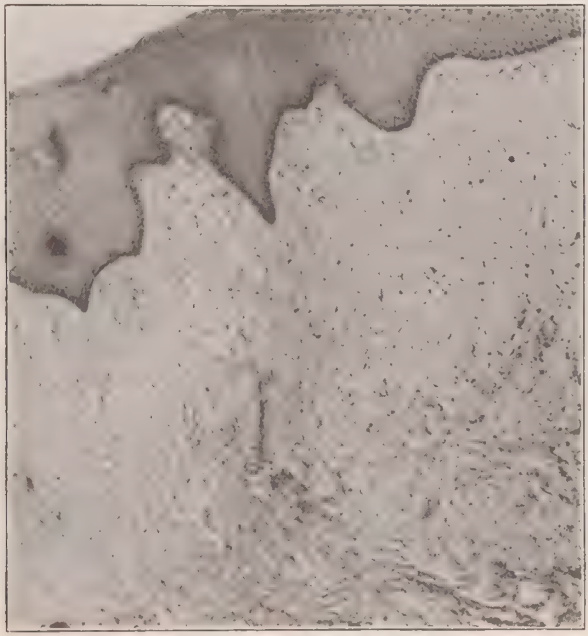

Fig. 2—Histologic appearance of section from fibrous epulis. Note interlacing network of fibrous tissue.

There is considerable confusion as to the proper classification of these growths, the literature both surgical and pathologic presenting many divergent views. Thus Bland-Sutton[1] terms the growth a "myeloma or red-marrow tumor." Nichols[2] regards it as a "bone-marrow or medullary sarcoma." Owen[3] describes the same thing as "myeloid sarcoma."

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1. Bland-Sutton: Keen's Surgery, i, 747.
2. Nichols: Keen's Surgery, ii, 69 and 70.
3. Owen: Keen's Surgery, iii, 643.

Other writers prefer to use the term "myeloma" rather than giant-cell sarcoma. The confusion is further increased by finding in works on pathology an entirely different growth described as myeloma, which contains no giant-cells whatever. Thus Mallory[4] describes the myeloma as a "tumor which arises within the bone-marrow and which is peculiarly characterized by causing the presence of albumose in the urine. * * * The cells are of medium size and irregularly spherical." Nowhere does he mention the presence of giant-cells in this growth. Mallory[5] further says that the term "giant-cell sarcoma" should be abolished. He states that at least two types of giant-cells are found in tumors, one resulting from multiple mitosis and signifying rapid growth, and the second, which is found most commonly in new growth involving bone. It is the latter type that is most frequently met in these giant-cell tumors of the jaws. Mallory looks on them as "foreign-body giant-cells, similar to the osteoclasts of normal bone, and are due to the fusion of endothelial leukocytes attracted into the tumor by the presence chiefly of lime salts which they dissolve and remove. They signify usually disintegration of bone. * * * The tumor containing foreign-body giant-cells should be classified according to the nature of the other cells present in the tumor; the foreign-body giant-cells should be disregarded. They do not signify either rapid growth or malignancy." From clinical observation of cases showing these giant-cells, we agree with

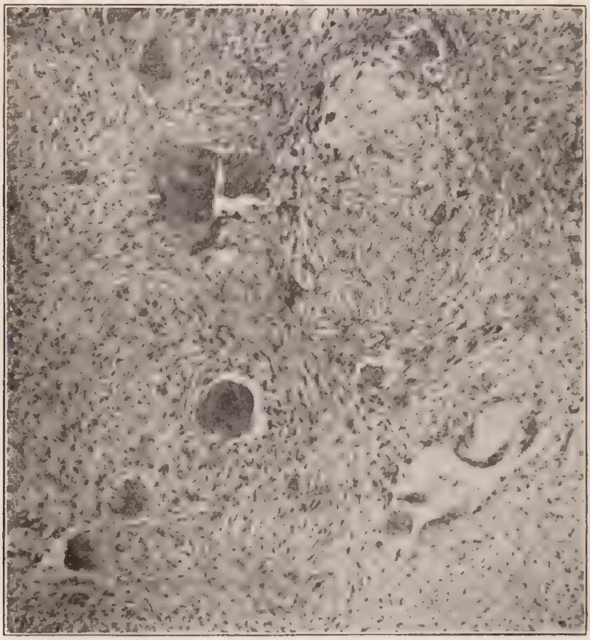

Fig. 3—Histologic appearance of section from giant-cell myeloma, common type. Small masses of bone and cartilage seen.

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[4] Mallory: Pathologic Histology, p. 338.

[5] Mallory: Pathologic Histology, p, 273.

Mallory that they signify neither rapid growth nor malignancy, but would go still further and say that their presence rather tends to show that the tumor is non-malignant in most cases. For we have seen several cases which, if the giant-cells were excluded, from the histologic appearance of the remaining tissue, would have to be classified as malignant sarcomas, and yet in which simple removal of the growth itself has resulted in perfect cure. The presence of giant-cells would therefore seem to be an indication that the malignancy of the tissue has been modified in some manner, and that they thus have considerable significance from the point of view of prognosis. It is unfortunate that there is no suitable name, agreed on by all, for this frequently occurring growth.

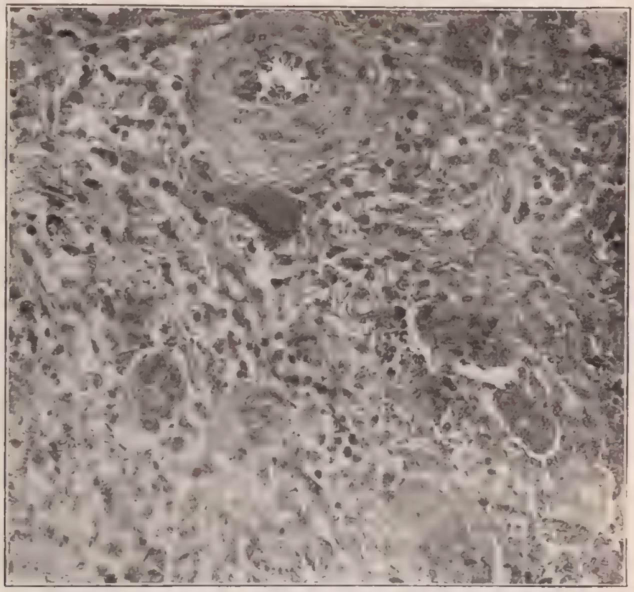

Fig. 4—Section from giant-cell myeloma, endothelial type, showing proliferation of endothelial cells.

There is, however, a tumor of the jaw rich in foreign-body giant-cells, which cannot be regarded as clinically benign. This type has recently been described for the first time by Whitman.[6] In the new type there is a proliferation of the vascular endothelial cells which extend to form the main elements of the tumor. Scattered throughout are numerous foreign-body giant-cells, a great many of which lie within the lumina of blood-vessels. Whitman concludes that myeloid or giant-cell sarcomas can be divided into two groups, the new group consisting of tumors very closely resembling the true myeloid sarcoma (that is, the form first described), but which are clearly of endothelial origin and the giant-cells of which are usually intravascular.

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[6] Whitman: *Jour. Med. Research*, January, 1914, p. 465.

We believe that the recognition of two distinct types of giant-cell myeloma is not only of pathologic interest, but is also of considerable clinical importance. I think we have all had the experience of cases in which a pathologic report of giant-cell sarcoma was rendered, and yet which pursued quite divergent clinical courses subsequently; in one case simple removal resulting in cure, in another followed by recurrence of the growth. From a study of our cases and comparison with that reported by Whitman, I believe that this clinical difference is due to difference in structure. Ordinarily, giant-cell tumors of the jaws are not to be regarded as clinically malignant, that is, they are sharply defined from the surrounding healthy tissue and shell out easily from the cavity in the bone. They produce no metastases, and do not occur after simple enucleation. Histologically and clinically, four of the cases of giant-cell tumor to be reported, were of the usual type (Cases 2, 3, 4 and 5). The other case (Case 6) corresponds closely to the new type described by Whitman, and in its clinical manifestations differed markedly from those belonging to the usual form. There was an extensive growth of the upper jaw, involving the maxillary sinus, not sharply circumscribed, and which recurred several times after apparently complete excision. Microscopically (Figs. 4 and 5), the growth consisted of a proliferation of the capillary endothelial cells to form the stroma of the tumor, and numerous spaces, evidently dilated capillaries, which contained foreign-body giant-cells similar in appearance to those of

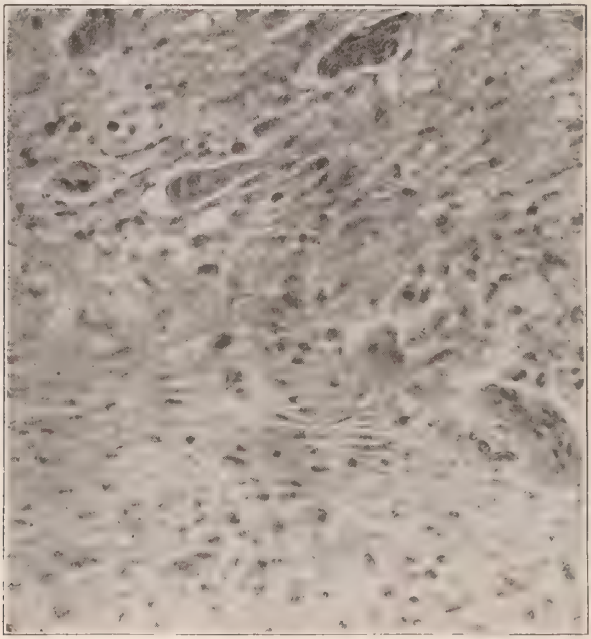

Fig. 5—Section from giant-cell myeloma, endothelial type.

the ordinary type of tumor. Whitman's case appears to be clinically similar to ours, as he states that it recurred twice after operation. These two cases, having similar clinical and histologic characteristics, form evidence that we are dealing here with a more malignant form of growth than the ordinary type of giant-cell tumor, requiring more extensive operation to ensure cure.

The unfortunate application of the term "sarcoma" to the ordinary giant-cell tumors of the jaws has led to much ruthless and unnecessary sacrifice of tissue in a part of the body in which a consideration of cosmetic results is secondary only to the life of the patient. There is no advantage in opening the face or excising half the jaw for the removal of these tumors when it is perfectly safe simply to shell out the growth from within the mouth without fear of recurrence. In the second or endothelial type, however, a more extensive operation is usually required. The nature of the growth can generally be recognized at operation, but if not, histologic examination will indicate whether or not further excision will be necessary.

REPORT OF CASES

Case 1. C. N., aged 37, was seen January 5, 1914, with a growth on the gum of the lower jaw that he said had been there for sixteen years. It was slowly growing larger, but caused no pain. Examination showed a hard nodular swelling in the alveolar region of the lower jaw, extending from the left first premolar to the right lateral incisor tooth, several of the intervening teeth being displaced or loosened. Diagnosis: fibrous epulis. Operation consisted in extraction of teeth involved, and excision of growth and alveolar process from which it arose. Uneventful healing ensued. Histologic examination shows growth to be a fibroma (Fig. 2). There was slight evidence of myxomatous degeneration.

Case 2. A. P., woman, aged 52. Patient first seen March 14, 1913. She had had no upper teeth for twenty years or more and wears a full set of artificial teeth. For at least ten years she has had a swelling on the right side of the upper jaw which never caused any pain, but is gradually growing larger and interferes with the fit of her plate. On the right side of the maxilla in the region of the alveolar ridge there was a smooth soft dark red growth, about one inch long by one-half inch wide. The tumor was excised by Dr. M. H. Cryer, without any attempt at removal of the surrounding healthy tissue. Healing occurred in due course without any recurrence or other complications. Microscopic examination showed a covering of squamous epithelium, while the interior of the growth consisted of a fibrocellular stroma containing many foreign-body giant-cells (Fig. 3). Diagnosis: Giant-cell myeloma, benign type.

Case 3. M. W., woman, aged 22. Patient first seen September 18, 1913, in association with Dr. R. H. D. Swing. For about three months she had noticed a gradually increasing painless swelling of the left side of the lower jaw, which caused displacement of teeth. Examination showed a smooth swelling of the gum on the left side of mandible extending from the first molar to the canine tooth. The teeth involved were sound but the premolars were somewhat displaced. The growth caused the internal and external alveolar plates to bulge, forming a thin shell of bone over it. The two premolar and canine teeth were removed together with their alveolar process and soft dark red material was curetted out from the thin shell of the bone forming the body of the jaw at this point. The continuity of the bone was preserved. Slow but uneventful recovery ensued, and no signs of recurrence appeared after nine months. Several small masses of gritty material were scattered throughout the soft tissue, which proved to be small areas of bone and cartilage on microscopic examination. In other respects the tissue was similar to that found in Case 2. Diagnosis: Giant-cell myeloma, of benign type.

Case 4. J. F., boy, aged 17. First seen January 10, 1914. Patient stated that for about six weeks he had noticed, slightly to the left of the median line, a painless swelling of the lower jaw, which was increasing in size. Examination showed a spongy, non-tender growth, extending from the symphysis to the left first premolar. The growth extended upward about the necks of the teeth and below caused a bulging of the alveolar plates. The teeth were irregularly displaced by the tumor. The Roentgenogram (Fig. 1) showed a light area in the alveolar process and body of the bone in the position corresponding to the growth. The operation by Dr. M. H. Cryer consisted of the removal of the teeth—from the right central incisor to the left first premolar—together with their alveolar process, and the shelling out of a mass of soft dark red jelly-like material from the deeper portion of the bone. This tissue lay in a smooth cavity in the bone extending almost to the lower edge of the mandible, and appeared to be separated from the healthy bone by a sort of fibrous capsule. The cavity in the bone is slowly filling up, with no sign of recurrence of the growth. The tissue was histologically similar to that found in the two preceding cases. The outer portion of the tumor consisted of a condensation of the fibrocellular tissue, containing no giant-cells in this situation. Diagnosis: Giant-cell myeloma, benign type (Fig. 3).

Case 5. R. D., boy, aged 9. Patient came to the clinic March 17, 1914, on account of a growth on the right side of the upper jaw. This growth had been noticed for about six months, and had been partially excised two or three times by a dentist, who took it for a simple hypertrophy of the gum, caused by the irritation from decayed teeth. The growth was gradually increasing in size, but never caused any pain. Examination showed a dark red, soft lobulated mass projecting from the right upper alveolar process at a position corresponding to the premolar teeth. The temporary molar teeth at this position had been lost, while the premolars were only partially erupted and covered by the growth. Operation March 20, by Doctor Cryer, consisted in excision of the tumor, extraction of the two premolar teeth, and slight curetting of the underlying alveolar process. Uneventful recovery followed. Microscopic examination showed the tumor to be a giant-cell myeloma of the benign type.

Case 6. W. T., man, aged 29. Patient was first seen December 2, 1913, with a swelling of the right side of the upper jaw that he had noticed for about six months. He complained of practically no pain, but several teeth had loosened and been lost. Examination showed a dark red enlargement of the right side of the upper jaw extending from the region of the canine to the second molar tooth. The growth was smooth, was not confined to the alveolar process, but caused a bulging over the hard palate almost to the median line. Operation by Doctor Cryer consisted in removal of the growth and bone from which it arose, through the mouth, without opening the face. The tumor was found to extend into the maxillary sinus, which was curetted and packed. Microscopically the tumor was found to be a giant-cell endothelioma (Fig. 4), similar to that described by Whitman (see above). February 23, 1914, a second operation became necessary, owing to recurrence in the maxillary sinus and toward the median line of the palate. This was also performed without opening the face, a considerable portion of the palatal process of the maxilla being cut away, so that an opening was made in the hard palate between the mouth and the nose. Two weeks later a third small operation became necessary owing to a slight recurrence in the region of the maxillary tuberosity. At present the patient is apparently cured, and a prosthetic appliance will be made to close the defect in the palate caused by the operation.

SUMMARY

1. Epulic tumors may be classified as hard or fibrous, and soft or giant-cell.

2. The giant-cell tumors of the jaw bones fall into the two distinct classes: (*a*) the ordinary so-called giant-cell or myeloid sarcoma; (*b*) the giant-cell endothelioma, recently described by Whitman.

3. Tumors belonging to Type *a* have all the clinical characteristics of and may be regarded as benign tumors, and require only local removal of the new growth itself as in the case of other benign growths.

4. Tumors belonging to Type *b* are more malignant and should be treated accordingly by more extensive operation.

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ABSTRACT OF DISCUSSION

Dr. R. P. Bay, Baltimore: I shall, in speaking of endothelial tumors, consider them not as epuli of the mouth, but as sarcomas. Some authors classify these tumors of the epulis variety as benign tumors which are histologically malignant; in other words, a sarcoma which is histologically malignant and yet benign clinically. As Doctor Ivy said, some cases of epulis and sarcoma around the gum are benign and some malignant; some shell out easily without much disfigurement or difficulty. In my experience it is impossible to apply any hard and fast rule in these cases. We consider, and probably we are right, that the older the individual the better the prognosis in cases of sarcoma occurring around the mouth, the same as we have in epithelioma and carcinoma. I have seen cases of sarcoma or epulis, and we may even see endothelial tumors occur practically at all ages from the infant to the advanced age of 68. We know absolutely nothing, so far as I know, of the cause of sarcoma or mesothelial tumors. It was once thought they were congenital. The most rapidly growing and the most advanced case I have had under observation was a case of giant-cell sarcoma, which the pathologist thought was a typical simple epulis, occurring in a child 10 years of age. It was removed by methods that would be accepted as probably more extensive than ordinarily required, but it recurred very rapidly and in six or eight months a complete resection of the jaw was necessary. That was, according to our knowledge of the pathology of these cases, the variety that shells out very easily, though this case was a typical case of giant-cell sarcoma. The epulis occurring in old people usually starts from some irritation. They practically always start, I believe, from the periosteum coming out directly from between the teeth. It is useless to shell out these eupli without removing at least one or two teeth, or at least the tooth they are attached to. I assert that those who are teaching oral surgery and who come in contact with students, should advocate the complete and early removal of tumors and lumps of whatever character occurring around the gum. They can be, of course, innocent, and possibly the majority are, but they certainly can be as malignant or more so than any with which we have to deal; so that we should advocate the early removal of all growths coming from around the gum when the periosteum is injured or from some other cause. I believe also that after we remove the growth with the knife, the tissues should be cauterized with the electric cautery.

Dr. Virgil Loeb, St. Louis: How does Doctor Ivy classify the epuli which he calls typical angio-epithelioma?

Dr. M. I. Schamberg, New York: We frequently hear of radical operations being performed for so-called malignant growths about the mouth, and it has been my experience that these giant-cell sarcomas are in a measure inflammatory growths; they really assume the form of inflammatory tissue. In fact, Doctor Bloodgood, of Johns Hopkins, has expressed a similar opinion with regard to the giant-cell variety of sarcoma. For that reason I am sorry that Doctor Ivy did not take up the subject from the etiologic point of view. These sarcomas are usually completely cured by simple removal. My experience conforms with that of those who have encountered these cases. I have run across few cases of giant-cell sarcoma that involved the maxillary sinus and which required further operation. I recently operated on one which appeared to involve the anterior wall of the antrum and caused the face to be quite prominent as high as the inner canthus of the eye and after the operation there was quite a bit of surgical traumatic thickening of the periosteum which led me to believe I was going to have a recurrence. In that particular case the patient had geen wearing some unhygienic bridge work in the mouth, with a cuspid tooth involved which I thought was the cause of this growth. After the removal of the tooth and the surrounding tissues by means of the curette followed by cauterization and packing the wound, the condition has completely subsided. Another feature of that case which led me to believe that it was largely inflammatory in origin, though under the microscope it showed the typical appearance of the giant-cell sarcoma, was that there were periodic swellings of the eye, with edema after the operation, which would give a clinical appearance of inflammatory growth. I believe, with Doctor Bloodgood, that these cases are of possible inflammatory origin and that these giant-cells occur as the result of some form of chronic irritation. We know, too, that the true epulic growths occurring in and about the mouth, that spring from the periosteum, are inflammatory in origin, and are either produced by irritation of the teeth or by motion between two closely approximating teeth. The etiology of these growths is of great importance as it tends to bear out the clinical findings. I might also refer to a multilocular cyst of the jaw which was extensive, extending into the neck of the condyle of the jaw and in which almost the entire half of the jaw was involved, which I operated on some years ago, which, under the microscope, was thought to be malignant, but clinically the case ran a benign course. It became a very extensive growth with no involvement of the adjacent lymphatic glands, nor has there been any systemic effect, though the growth had assumed large proportions. In that case there has been almost complete regeneration of the side of the jaw and ramus.

Dr. F. B. Moorehead, Chicago: Histogenetically, there are three distinct varieties fo fibroma found in the mouth—from the gum, from the periosteum and from the peridental membrane. The difficult feature is to determine the parent cell and be guided entirely by that in the removal of these growths. There are some sharply defined clinical characteristics that will lead to a conclusion as to whether they come from connective tissue in the gum, in the peridental membrane or in the periosteum. It is perfectly obvious that, if the fibroma has originated in the peridental membrane, the simple enucleation, so-called, is going to fail and the removal of the tooth in that case is always indicated. If, on the other hand, it originates in the periosteum, then an incision down to and including the periosteum is lla that is necessary. This is an important point. One striking thing about this whole meosthelial group is that the malignancy has a definite relation to the size of the element. The smaller the element, the more malignant, and when we have the small round-cell type it is an extremely malignant form. Some run a benign course throughout, while othesr are malignant from the beginning. Others begin as benign tumors and later degenerate into malignant tumors. We should look with suspicion, therefore, on all connective-tissue growths found in the mouth. I wish we might get away from the term "epulis." It means nothing and is frequently misleading.

Dr. C. K. Teter, Cleveland: One important point is the accuracy of the report from the pathologist. Anybody doing much of this work gets into deep water sometimes if he accepts the report of the pathologist as final and carries out his work along that line, as two cases I will speak of will show. One case which occurred about eight years ago was that of a small tumor on the side of the upper jaw, located near the upper third molar, and which turned out to be a fibroma. After the tumor was taken out, which was easily done, it was sent to the pathologist and the report came back to me that it was a giant-cell sarcoma. I felt it my duty to notify these people and to tell them that a far more radical operation should be done. They did not see fit to have the operation, and eight years have elapsed without a recurrence. That family has been quite indignant with me because I suggested a radical operation. Two years ago I had an old gentleman over 80, who had a growth in his upper jaw which entirely filled the antrum and which shelled out easily. It was a spongy growth. I sent it to the pathologist and the report came back to me that it was a simple papilloma. I did not think anything further was necessary if that was the case, as the tumor came out practically intact This man died from a sarcoma in about three months. I simply call attention to the fact that it is important to have an accurate pathologic examination.

Dr. T. L. Gilmer, Chicago: I would second Doctor Moorehead's remarks relative to the name, epulis. It is misleading and conveys a wrong impression, since the growths under consideration do not spring from the gum, as would be indicated by the name. I believe, with Dr. Schamberg, that the so-called epulis arises from irritations in most instances. If we examine the teeth closely, which these tumors approximate, a bit of calculus or a sharp edge on a broken or decayed tooth or root is generally found, or there are pockets about the teeth in which food or other debris has lodged. Those growths, sometimes called epulis, originating within the bone, are of a different origin and are more likely to be malignant. I have noticed that the tumors under discussion are malignant in proportion as they grow rapidly or slowly, those growing the most rapidly being the most malignant. Tumors of slow growth having the appearance of a fibroma, are most likely to be, histologically, giant-cell sarcomas. If they grow quickly and are soft and more vascular, they are more likely a different type of sarcoma, that is, of the spindle or round-cell variety and are always malignant, while the giant-cell type is not usually so. With regard to radical operations for the removal of these growths, I read a paper some years ago in this section relative to radical operations for removal of tumors of the mandible. My belief was, and still is, that unless there is positive evidence microscopically that a tumor of the mandible is a rapidly growing malignant growth, a less radical operation should be first done and the case watched, rather than to sacrifice a large section of the jaw, which in the past has been done too frequently. I would not, however, simply snip off the growth; I would cut away all bone up to what appears to be immune area.

Dr. John S. Marshall, Berkeley, Cal.: I have been much edified by the discussion of this subject. I remember when a paper of this character would have fallen flat before a dental society; it would not have been discussed at all because nobody would have been capable of discussing it—but now more than half a dozen young men are capable of discussing this question in all of its aspects. This is particularly gratifying to me because I feel that I have had some little part in stimulating the young men to take up the subject of oral surgery. In my teaching work I have endeavored to impress on the minds of the young dentists in my classes that this was their particular field and should not be turned over to the general surgeon. Most of our young men have been afraid to tackle these cases, largely because the schools do not give the proper training in anatomy, histology, pathology and histopathology. The schools, however, have improved very much in that line in the last few years, and I am greatly pleased to see so much interest taken in this subject in this society, because it has been the pet subject of my professional life. When I first started out to study oral surgery, thirty-five years ago, about the only man who was doing anything was Doctor Garretson, of Philadelphia, who, by the way, was the Nestor of oral surgery in this country. He said, in his talk on tumors, "If you cannot easily explain the character of a tumor as being positively malignant, treat it as a malignant tumor anyway and remove it," and that has been my practice. I do not temporize with them. If I cannot explain their character, I treat them as malignant and take them out, and I know positively that I have saved many lives by doing this. The application of irritants to a carcinoma or epithelioma is much like touching a match to the material of a bonfire—they go very quickly. There is nothing that will eradicate them so well and so surely as the knife, provided the operation is made before the glandular structures have become involved.

Dr. R. H. Ivy, Philadelphia: With regard to the etiology of these tumors, I have seen cases in which there was no indication of any inflammation or irritation, and others, on the other hand, which presented marked signs of inflammatory irritation, so that we cannot say definitely that these growths are stimulated by inflammatory conditions. In speaking of "shelling out" the tumors in treatment, I do not mean to avoid extracting teeth or removing bone from which the tumors may spring; I mean to extract the teeth involved, then simply enucleate the tumor itself, taking away as little of the good bone as possible. Again, I think we can generally diagnose the variety of the tumor by whether it is hard or soft. The great majority of fibromas are hard, while the giant-cell tumors are usually soft. Cases of fibroma may be found in mouths that are in a filthy condition, and I have seen the soft variety of epulis in clean mouths. In the pathologic diagnosis of these cases I believe that the surgeon or somebody connected with his clinic should follow them to the laboratory and confer with the pathologist. In that way I think there will be few mistakes and we will have few conflicting reports from the laboratory. With regard to the term angioma, in classifying tumors, it depends on the amount of vascular tissue found in them. If we find a fibroma which contains a large amount of vascular tissue we might call it an angio-fibroma.

METHOD OF SEPARATING AND REGAINING SPACE WHERE TEETH HAVE BEEN LOST FOR SOME TIME

BY LEWIS G. WATKINS, DETROIT, MICHIGAN

Cases are often presented to us where it is desirable to reclaim the use of a root that has lost its crown. However, upon examination, we find that the crowns of the teeth adjoining the space have drifted out of normal contact with their neighbors to a point where it is not possible to place a crown of sufficient width and size. This condition may be obviated by using an old but effective method which is as follows: Place the end of an elm stick in a vise and compress until it can be slipped into the space to be separated, and sawed off short enough to avoid interfering with the articulation. In cases where a very short root is to be reclaimed, a piece of softened gutta percha may be placed over the root end to force the gum tissue away and the wedge inserted over it. Sufficient expansion of the wood will take place as soon as the saliva comes in contact with it, to produce a gradual and quite comfortable separation which will continue for several hours. It is well not to force this wedge in too tightly, since a too rapid separation will result with much discomfort to the patient. In most cases one wedge worn from twenty-four to forty-eight hours will provide the desired space, while in some cases two wedges may be necessary.

This method not only has the effect of producing a separation but has a far more important one, i.e., forcing the drifted adjoining teeth back into firm contact and tilting their occluding surfaces into correct alignment and articulation, thereby eliminating one of the fertile causes of pyorrhea pockets. There need be no fear of losing the space obtained, while the crown is being made and adapted, since the wedge may be removed and replaced as often as necessary. Hickory was formerly recommended for making these compressed wedges, but I have found that elm is better since it is a soft wood that will admit of considerable more compression without splitting, and will take up moisture more rapidly.

RELATION OF DIET TO DENTAL CARIES AND MOUTH INFECTION

BY J. H. KELLOGG, M.D., LL.D., F.A.C.S., BATTLE CREEK, MICH.

(*Continued from page 665 August Summary*)

It is evident that current notions respecting feeding have given to protein a much more prominent place than it deserves. Protein is obviously an essential element of nutrition, but the amount required is certainly much smaller than has been supposed and taught by such eminent authorities as Voit, Pettenkofer, Atwater and others.

Notwithstanding the extended experiments which have been made it must be admitted that the minimum requirement of protein is not at present known, but a very exact idea of the maximum requirement may be obtained by the study of nutrition in infants. Rubner has made a most interesting study of the diet of the nursing infant. That mother's milk contains all the protein that the growing infant requires is a proposition not likely to be disputed. Nature always takes care that the needs of the infant are amply supplied even at the expense of the mother. Rubner has shown that the ration of the nursing infant supplies it daily with one-half gram of protein per kilogram of body weight, or nine-tenths of one calorie per pound daily. This proportion would give to an adult weighing 160 pounds 144 calories of protein or about one and one-half ounces of dried protein. This amount is perhaps not more than one-third of that taken by the average man, and yet it must be entirely ample, for the ration of the growing infant provides not only for repair but for growth. In the case of the adult it is only necesssary to supply protein enough to make good the daily losses of the body through wear and tear, the actual amount of which is probably less than half the above figures.

It is evident then that the diet of the average man contains a great excess of protein which not only imposes an enormous extra burden upon the liver and kidneys, increasing the work of the kidneys to at least three times the work required on a low protein diet, but gives rise to an enormous amount of undigested and unusable residue which provides the most favorable nutrient media possible for the development of putrefactive organisms in the colon, thus flooding the body with resistance-lowering toxins and laying the foundation for tissue degenerations of various sorts, including depreciation of the dental structures.

That a non-flesh diet is entirely sufficient to support the body in a high state of vigor is now no longer a mooted question; all physiologists admit the sufficiency of the original primitive diet which still sustains in a state of marvelous vigor that giant forest-man, the gorilla, and also supports at least nine-tenths of the inhabitants of the world.

An extended series of metabolism studies conducted by Dr. Paul Roth in the physiologic laboratory of the Battle Creek Sanitarium have shown that the basal metabolism of a non-flesh eater is on the average twenty-five calories to the kilogram, which is equal to that of a high protein feeder. This was true notwithstanding the fact that a large proportion of the flesh eaters studied in another laboratory by the same method were athletes and consumed large quantities of flesh. The complete protocols of these observations will soon be published and ought to settle once for all the question of the competency of a low protein diet to maintain a high state of physical vigor and efficiency.

The suggestion that a free meat diet promotes dental decay is by no means new. Observing dental surgeons have long known that there is a connection between meat eating and dental decay. Fibers of meat caught between the teeth furnish highly favorable media for the growth of destructive bacteria; another important fact is that meat carries into the stomach enormous quantities of putrefactive organisms, which by promoting putrefactive changes, flood the body with toxins which in turn lower the vital resistance and increase the susceptibility of the teeth to the influence of destructive agencies.

The following table shows the number of putrefactive bacteria found in ordinary samples of meat, as sold in the market, by Dr. A. W. Nelson, bacteriologist of the Sanitarium laboratory.

		Putrefactive Bacteria per gram (moist)	
	Specimen	When purchased	After 20 hrs. at room temp.
No. 1	Large sausage	420,000,000	490,000,000
No. 2	Small sausage	663,000,000	640,000,000
No. 3	Round steak	560,000,000	840,000,000
No. 4	Roast beef	560,000,000	750,000,000
No. 5	Smoked ham	43,120,000	750,000,000
No. 6	Hamburger steak	129,000,000	700,000,000
No. 7	Pork	126,040,000	1,036,000,000
No. 8	Porterhouse steak	30,000,000	700,000,000
No. 9	Sirloin steak	378,000,000	......
No. 10	Tenderloin (well done)	25,200,000	......
No. 11	Tenderloin (rare)	168,000,000	......

It seems quite inconsistent that we should be so much concerned about reducing the number of bacteria in milk, which at the worst is not likely to contain more than one or two million bacteria to the cubic centimeter, whereas steaks and chops ordinarily contain several hundred times as many bacteria as do the worst specimens of milk. It should be noted also that the bacteria found in milk are there because of the large amount of sugar present, and are seldom of a dangerous character, consisting almost exclusively of acid-forming organisms, while the bacteria of beef are almost exclusively proteolytic in character, such as Welch's bacillus, bacillus subtilis, bacillus putrificus and other pernicious organisms, many of which are capable of producing deadly infections. Besides, the acids which are produced by the germs in milk are harmless, whereas the ptomaines and toxins produced by meat bacteria are highly toxic, some are, in fact, equally as virulent as the venom of deadly serpents.

It is worthy of note that within the last century, during which time there has been observed a very marked increase in the prevalence of dental caries, the use of butchered meat has increased very greatly. According to the best authorities the per capita consumption of meat at the present time is nearly four times the amount consumed per capita one hundred years ago.

Another fact which I believe to be highly active in promoting teeth decay is to be found in the deficiency of lime afforded by our modern dietaries. A striking proof of the damage to the teeth which results from a deficiency of calcium is afforded by a study of the great collection of skulls in the Royal College of Surgeons, in London. J. G. Turner, who made careful examination of this interesting collection, states that "Among British skulls dating from about 1650 to 1840, the incidence of both dental caries and pyorrhea alveolaris is very small. That is, there was an absence of dental sepsis when bread was made of coarse ground meal and sugar was a scarce article of diet. Nowadays, with impalpably ground flour and a superabundance of sugar, we find dental sepsis in almost every mouth."

In the study of dietetics too large a proportion of attention has been given to the nutritional value as estimated by the number of calories of protein, fats and carbohydrates, and too little attention is given to the content of calcium and other salts.

Comparatively recent experiments have shown that most surprising results may be obtained by the addition or subtraction of small amounts of calcium or other mineral elements essential to tissue building. Certain elements are essential to the building of a healthy cell; if a single one of these elements is lacking or deficient, the cell cannot be built. In the case of young animals such deficiency leads to an arrest of growth. In adults, the defect shows itself in premature decay.

Calcium is essential for all the tissues of the body, but especially for the bones, which contain 99½ per cent. of all the calcium found in the body. The teeth, being the densest structures in the body, are evidently more dependent upon lime than any other structures, and more likely to be affected by any disturbance of the calcium metabolism, than other structures. The ordinary tissue activities upon which life is dependent result in the daily loss of from a gram to a gram and a half of lime. To replace this and prevent a gradual diminution of the body store of lime which for a man of medium weight, say 150 pounds, is only 4.2 pounds, it is necessary that the average daily ration should contain from two to two and one-half grams of lime, since according to Forster, only 60 per cent. of the lime of the food is absorbed. This amount of lime, 30 to 35 grains, is by no means always found in the regulation bill-of-fare.

Dr. Lauder Brunton insists that one reason why we lose our teeth is because we do not get enough lime in our food. Bunge of Basel, and Sherman of Columbia, have pointed out that half the civilized world is suffering from lime starvation through the use of foodstuffs which contain little or no lime. The body loses daily thirteen grains of lime in the excreta. This must be replaced. If it is not replaced by the food, the bones and teeth are robbed of lime and thus softened.

The lime content of foods varies greatly. Some of our staple foodstuffs contain practically no lime at all. A pound of wheat or graham flour contains four grains of lime; a pound of fine flour but one grain; a pound of meat half a grain; a pound of potatoes a grain or less; a pound of sugar none at all. A pint of milk contains fourteen grains of lime; a pint of cream three-fourths as much; a pound of butter almost none at all. Peas and beans contain fourteen grains of lime to the pound.

It is evident that sugar, though a carbohydrate, is no substitute for the carbohydrate of cereals; and lean meat, though rich in protein, is not a proper substitute for the protein of vegetables; because in both instances the lime which is in man's natural diet associated with the carbohydrates and proteins in the proper proportion, has been separated, in one case by an artificial process and in the other by a natural process. The corn which the hog eats contains an abundance of lime, but, when assimilated, the lime is separated, going to the bones, while each other food principle goes to its proper tissue—the protein to the muscles, the starch and oil to the fats. When the hog is eaten, the bones are left behind, and the lime with it.

The annual average per capita consumption of meat in the United States, including fish and fowl, is 240 pounds, or two-thirds of a pound a day for each man, woman and child. The per capita consumption of sugar is over eighty-two pounds, or about four ounces a day. With the addition of butter and other foods, these items furnish three-fourths of the nourishment of the average citizen of the United States, and supply practically no lime. Here is abundant reason for decay of the teeth, and the depreciation of stature.

Still other foods besides those mentioned are notably deficient in calcium; for example, while meat contains only half a grain to one grain of calcium to the pound, corn meal, corn flakes, rice and rice flakes contain even less. Ordinary bread contains only a grain and a half of lime to the pound, and potatoes one grain to the pound, or no more than meat.

A glance at the accompanying table which gives the number of grains of lime per pound, will show at once that a large proportion of our ordinary food stuffs are unable to supply the body with an adequate amount of lime.

Suppose, for example, a day's ration should be made up of the following: Meat, three-fourths pound; bread one-half pound; butter three ounces; rice two ounces; corn meal or corn flakes, two ounces; sugar, two ounces; potatoes, one-half pound; a total of about 2,500 calories. The total amount of lime supplied by such a diet would be less than two and one-fifths grains or only about one-fifteenth of the amount of lime required, leaving a deficiency of fully thirty grains. There are plenty of people living on a diet which is still more deficient in lime. Invalids, for example, are often fed for quite long periods on tea and toast with some appetizing adjuvant. The intake of lime under such circumstances would be scarcely one grain, or about one-thirtieth the amount required.

TABLE SHOWING THE

AMOUNT OF LIME PER POUND IN VARIOUS FOOD STUFFS.

ANIMAL FOODS, CEREALS, ETC.	
Porterhouse steak	1.0
Mutton	.5
Butter	1.5
Buttermilk	11.0
Milk	11.0
Cream	10.0
Pearl Barley	1.6
Corn Meal	.6
Hominy	1.0
Toasted Corn Flakes	1.0
Oatmeal	8.0
Rice	.8
White wheat flour, crackers, macaroni	2.0
Wheat flakes and cracked wheat	4.0
Bread	1.5
Honey	.3
Sugar	0.0
VEGETABLES.	
Beans, kidney, dried	15.0
Beans, string, fresh	5.0
Cabbage	4.0
Carrotts	5.0
Celery	6.0
Corn, canned or green	3.0
Cucumbers	2.0
Eggplant	1.0
Greens, turnip tops	34.0
Greens, soup greens (assumed)	5.0
Lettuce	3.0
Onions	3.0
Parsnips	5.0
VEGETABLES, Continued.	
Peas, dried	9.0
Peas, canned	1.5
Potatoes	1.0
Potatoes, sweet	1.6
Pumpkins	2.0
Radishes	1.6
Ruta-begas	7.0
Spinach	4.0
Tomatoes	1.2
Turnips	6.0
Water cress	17.0
FRUITS.	
Apples	.7
Apricots	1.5
Bananas	.6
Balckberries	5.0
Blueberries	3.0
Cherries	1.8
Dates	7.0
Figs, dried	19.0
Grapes	1.0
Grape fruit	2.0
Huckleberries	2.5
Oranges	3.0
Peaches	1.0
Pears	1.0
Prunes	4.0
Raisins	3.0
Raspberries	5.0
Strawberries	4.0
Watermelons	1.2

That there are foods which contain an abundance of calcium will be shown by reference to the accompanying table of selected foods which are rich in this important element:

The body of a man weighing 150 pounds contains four pounds of lime. If as a result of an ill-arranged bill-of-fare such a person should suffer a daily loss of twenty grains of lime, the result would be a loss of more than one pound of lime in the course of a year or twenty-five per cent. of the total lime content of the body.

Von Wendt made extensive experiments of the influence of various dietaries on the calcium balance and found on a diet consisting of bread, butter, sugar and egg white, which furnished almost no lime, the loss of lime the first day was, grams .138; the loss the second day was grams .647; and the third day, grams .796.

On a diet consisting of bread, butter, meat, cheese, tea and sugar the loss reached on the fourth day was grams .912. That is, the amount of lime eliminated through the kidneys and the intestine was nearly one gram or fourteen grains more than that which the food contained.

Since eating habits are very often quite fixed and uniform during long periods, it is evident that the danger from loss of lime must be very much greater than has been understood.

Sherman found in his experiments that the skull of a monkey deprived of lime acquired the thinness of paper and could be easily crushed with the fingers.

(*To be continued*)

A FEW FACTS IN REGARD TO PRELIMINARY EDUCATION*

BY R. L. SPENCER, BENNETTSVILLE, S. C.

IN PRESENTING THIS PAPER, I shall not mention the name of any dental college, or any person connected with a dental college, for I am not making a personal fight on any person, or any college. I am fighting for higher and better preliminary education, and I shall keep on fighting until the shadows close in upon me. I am presenting the facts in this paper from a sense of duty, with malice toward none, and charity toward all.

As a matter of convenience, I have divided the education of a dentist into two parts: *First*, that which he should possess at the time he begins the study of dentistry, or preliminary education; *second*, that which he should obtain thereafter, or professional education.

Preliminary education, in its relation to professional education, is the subject to which I wish to direct your attention; and to my mind this subject is the most serious one which now confronts the dental profession, and more especially the dental profession of the State of South Carolina. It is the opinion of your "humble servant" that every person who enters upon the study of medicine, or dentistry, should possess a preliminary education equivalent to the A.B. or B.S. degree as conferred by our state institutions of learning. This is a high ideal, and comparatively speaking a high standard; and while I realize that I have hitched my wagon to a star, yet I hope to see the day when this high standard will have been enacted into law in the proud Palmetto State. Aside from the many other reasons, any person who expects to enter any profession, should first obtain a college education, for the benefit of that mental and intellectual development which can be attained in no other way.

The recent advances in prophylaxis, bacteriology and anesthesia have placed in our keeping, as co-partners and co-laborers with our medical brethren, the health and the lives of those whom we profess to serve. Just think of it! The health, and possibly the life of your patient, depends upon your efficiency.

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*Read before the South Carolina State Dental Society, 1915.

It is a well known fact that the strength and stability of any structure depend primarily upon its foundation; and today I serve you notice that the dental profession can not measure up to the duties and responsibilities which it must inevitably face, unless its foundation is laid on a broad and liberal preliminary education. I realize that this high standard, this lofty ideal, which I am advocating, can not be attained in one short year, or even in several years; and I further realize that if it is ever attained it will be through the efforts of those who are determined to elevate dentistry to that high plane of honor and usefulness which is accorded to every educated profession.

Those of us who are endeavoring to blaze the way of progress to that high ideal, which I have just outlined, are beginning to receive the support of many well informed people, who have no interest in dentistry other than their own personal welfare, and the welfare of those dependent upon them. From every section of the State comes the demand for better and higher education in every line of work.

The standard of dental education that is maintained in this State depends entirely upon our Dental Association and our State Board of Dental Examiners. Upon our State Board of Dental Examiners, the responsibility rests heavily, for unto them have we delegated the authority to say who shall, and who shall not, practice dentistry in this State. When a young man has spent three years in a dental college and obtained a diploma, he feels, of course, that he has a right to begin practice. To refuse such a one a license is a grave responsibility, but on the other hand it is a crime against humanity to grant a license to one who is incompetent. The duty of our State Board of Examiners in the granting and the refusing of licenses is a most serious matter, and it is the duty of this Association to place on our Board only such men as will face this duty and responsibility fearlessly and conscientiously.

Our State Board of Dental Examiners (and indirectly our State Dental Association) has been the subject of much adverse criticism, both within and without the state.

Some months ago a young lawyer said to me: "Your Board of Examiners is entirely too easy." I then said to him: "What reason have you for this remark?" He replied: "Some years ago, when I was a boy and in need of dental services, I visited a dental parlor in Greenville. Of course, I thought the fellow was all right, simply because he had received his license from the State Board; but I found to my sorrow, after I had been mutilated for life, that the fellow was entirely incompetent."

At the meeting of the National Association of Dental Examiners, held July, 1914, Dr. R. C. Henry of Tennessee, said: "In South Carolina a few weeks ago, the Board in discussing this matter (preliminary education), stated that from eight to ten points of Carnegie units was all they could require in that State, because their State, as a rule, did not offer the educational facilities." This statement, made by Doctor Henry, for which he had no authority other than that he heard it in the train on the way to a meeting, is erroneous from beginning to end. No such action was taken by our Board of Examiners in either 1913 or 1914; in fact, quite a different action was taken. I shall show later that the educational facilities of South Carolina are entirely adequate to the demands for preliminary education.

A few years ago, some of our friends in North Carolina ventured the assertion: "South Carolina is only a dumping ground for the refuse of her neighboring states; and when a man fails before the North Carolina Board, he moves over the line into South Carolina and obtains his license."

In reference to this criticism, I wish to say that the men who have served on our Board of Examiners from time to time, are good, true men, who have endeavored to perform their duties faithfully; and such criticism of them, either from within or without the State, should not be tolerated. The only criticism that possibly could be brought against them is that they probably have made the mistake of placing too much confidence in some of the dental colleges.

Of course, there are exceptions to all rules, but I am convinced of the fact that the majority of the failures before our Board of Examiners can be attributed directly to a lack of preliminary education. Some of these poor, unfortunate fellows have such limited preliminary education that they are unable to comprehend the instruction that is afforded them in the dental colleges; and how they obtain diplomas is a question for some one else to answer. I have had letters from some would-be dentists, who seemed not to know that the first word of every direct sentence should begin with a capital letter; and others have applied for license who did not, or who could not, write simple English reasonably correct; yet these men had diplomas from dental colleges. Such ignorance is not to be tolerated, and no one should be surprised when such men fail to obtain licenses.

In order to correct this condition, our Board of Examiners at its 1913 meeting unanimously passed the following resolution: "That after 1915 all applicants for license must present as a preliminary requirement a high school diploma, or its equivalent." And in 1914 this rule was amended, by unanimous consent, so as to read: "A State high school diploma, or its equivalent of 14 units."

It stands to reason that any man entering upon the study of dentistry, or any other profession, should possess at least as much preliminary education as is required of the boys who enter Wofford College, and the girls who enter Chicora, or Converse.

I have a letter from the Secretary of the National Association of Dental Faculties, from which I quote: "Rule 1, Regulating admission of students—preliminary examination. Each student seeking admission to any college of this Association shall have completed an accredited high school course, or shall successfully pass an examination the equivalent of such high school course. The understanding is that fourteen units count for a high school course, though there are some high schools that have sixteen, and a few eighteen. Our requirement, as you know, is fifteen units."

It is self evident that the preliminary educational requirement, as adopted by our Board of Examiners, is exactly the same as the rule of the National Association of Dental Faculties, which was adopted in 1909.

All of the colleges, from which we are accustomed to receive applicants for licenses, so far as I have been able to ascertain, claim to be members of the National Association of Dental Faculties, and profess to abide by its rules and regulations; but notwithstanding this fact, the president of our Board of Examiners instructed me, as secretary, to inform them of our preliminary educational requirement. This duty I performed during the summer of 1914, and the replies which I received show the attitude of the various colleges to this rule. Several colleges replied very courteously, thanking me for the information, but made no comment, either for or against the rule. A few others wrote me most commendable letters. One college, in speaking of our Board of Examiners, said: "Your idea of high standing is right. We are trying to keep up the standard, generally understood as necessary, and we even go a little beyond it whenever possible. We are fighting hard for good rules, sensible rules, proper rules, and we will fight to the death to maintain them." Another college said: "Our entrance requirements are sixteen units, and you will see therefore that our requirements are even higher than the National Association of Dental Faculties." I was glad indeed to receive these two letters, and all of us should feel very much gratified to know that these institutions are maintaining such a high standard.

I regret to say, however, that a few dental colleges protested vigorously against our educational requirement. One, in quoting statistics, which they had compiled, said: "In taking strictly tenth grade certificates, you will see that we lose just 21 per cent. of our prospective students. Should the requirements be for the eleventh grade certificates, we would lose 63 per cent. of our prospects. This would give us a class so small that it would not pay expenses." I was not only surprised at this letter—I was very indignant. Here is a dental college, which admits that it can not pay expenses if it comes up to the standard. In other words, it must exist on money received from men who are not prepared to enter upon the study of any profession. This college is also loud and boastful in its advertisements. In one place it says:"The high rating of the students from ——— college before the various State Boards is matter of congratulation." In the report of National Association of Dental Examiners, this college has a record of 37 per cent. of failures for 1914, and an average of 23.9 per cent. of failures from 1910 to 1914 inclusive. I fail to see how this, or any other college, can congratulate itself on such a report.

Another college, which seemed to have serious objections to our requirement, wrote me quite a lengthy letter, in which they endeavored to show that the educational facilities of South Carolina are inadequate for our fourteen unit rule. This claim is absurd, and such criticism of South Carolina's educational facilities is unjust and unfair.

The records of our Board of Examiners show that during the past ten years we have had two hundred and ninety-seven (297) applications for licenses, an average of 27.9 per year. Some of these were "hold-overs", and quite a number came from other states, which brings the average down to about twenty South Carolinians per year. But in order to be strictly on the safe side, I will say that the average number of applicants is thirty per year.

By reference to page 167 of the 1914 report of Mr. Swearingen, State Superintendent of Education, I find that there are in this State twenty-five public high schools of the fourteen unit class. In addition to these, there are a number of private schools in the same class.

Recently, I had a personal interview with Prof. C. V. Neuffer, Superintendent of Bennettsville Schools, and Treasurer of the South Carolina State Teachers' Association, who is in close touch with the schools of the State, and well informed on school work. He informed me that the high school in Bennettsville could easily accommodate thirty pupils more than are now enrolled. He also stated that *at the very lowest* estimate the fourteen unit high schools of this state could easily accommodate three hundred pupils more than are now enrolled. I have had quite a number of letters from other Superintendents of schools which corroborate Mr. Neuffer's statement. From the above facts, we see that the average number of applicants per year is not more than thirty; we also see that at the lowest estimate, the unused (the unoccupied) educational facilities of our fourteen unit high schools is three hundred, therefore the educational facilities of South Carolina (from a preliminary point of view) are ten times greater than the needs of the dental profession.

Referring again to the 1914 report of National Association of Dental Examiners, page 56, we find the entrance examination of a certain dental college was as follows:

"What is your name?

"Where do you live?

"How old are you?

"Are you married?

"Have you any children?

"What did you do before entering college?

"How do you like dentistry?"

Such an entrance examination is not only a farce—it's a shame and a disgrace to the dental profession. The time is at hand when such an institution should be forced to close its doors.

From the foregoing, it appears that there are some dental colleges which are so besmirched with greed, so dyed in commercialism, that they will matriculate any person who has the price.

HEALTH CONSERVATION

A THOROUGH COURSE IN HYGIENE FOR COUNTY TRAINING SCHOOLS FOR TEACHERS*

BY FRANK W. MILLER, COLUMBUS, OHIO

STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

THE LEGISLATURE OF OHIO, in a special session held less than a year ago, enacted a law requiring professional training of all the men and women who wish to enter the profession of teaching in the village and rural districts of this state. The normal school facilities at the time were inadequate to prepare this army of trained workers that must be added to our teaching force each year. To meet this demand the new law made provision for establishing normal training departments in connection with first grade high schools, not to exceed three in each county. The aim of these schools is to prepare teachers for the village and rural schools, and to emphasize rural life and rural organization.

The educational system of our entire country, if not the entire world, has been undergoing a transformation during the last fifteen or twenty years. During this period many of the time-honored subjects which we studied so carefully in the past have either been laid aside or are so taught as to develop their practical applications to life. We still recognize the fact that the great aim and purpose of education is and should be the development of the best and most sterling qualities of genuine manhood and womanhood, but we also recognize the fact that these qualities can be developed by teaching subjects that have a practical value as well as by teaching subjects that are of no practical use in after life. Our experience in the schoolroom the last ten years has demonstrated that industrial training, when work is done which requires skill, accuracy of measurement, sharpness of the eye, alertness of the mind, decision and exercise of judgment, develops the mental faculties and strengthens the mental fibers of the youth so that he can do better work in his academic subjects than he would be capable of doing without such industrial training.

The same principle holds good in our study of physiology. Instead of studying it today as we did when you and I were boys at school, we are now teaching children so that they will comprehend the general truths of the subject and their bearings on daily conduct. The welfare of the family underlies the welfare of society. Vigorous health underlies the welfare of the family and the happiness of its members. The course in physiology in these normal training schools places special emphasis upon hygiene, so that the young men and the young women who receive their instruction in these schools and become the future teachers of our boys and girls may be able to teach our children what to do to preserve health.

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*An address before the Ohio State Dental Society, 1914

In addition to studying the structure of the teeth, the children should be taught that bad teeth are not only an inconvenience and something unsightly to the eye, but a menace to health; that bad teeth lead to poor digestion, and poor digestion will sooner or later undermine the entire system. Our children should learn how to take care of their eyes so that they may continue to see; they should learn how to take care of their ears, so that they may continue to hear. If our prospective teachers are to be taught properly, there will be needed men and women who are experts in the subject.

Realizing the need of expert help along these lines, I appeared before the meeting of the State Medical Association, held here in June, and asked their co-operation and help. In a true philanthropic spirit there was a favorable response. The Ohio State Dental Society and the State Medical Society kindly and generously agreed to have delivered in every one of those county normal schools a series of lectures upon such subjects as oral hygiene, first aid to the injured, hygiene of the home, hygiene of the community, hygiene of the eye, ear, nose and throat, the feeble minded and epileptic, hygiene of womanhood, and other subjects. These lectures will have in them demonstrations such as you have seen out here this evening, and will be of priceless value to those who are to instruct our youth. We, as teachers, have read and reread time and again the pages of our school textbooks on physiology and hygiene, what to do in a case of drowning, and yet if any of us were to stand by the side of a stream, and someone were pulled out apparently dead, we would probably stand there and sympathize with him, and wonder what to do. In one of those lectures a trained physician will place a boy on the floor who will represent the fellow pulled out of the water, and who lies there as though dead, and the physician puts him through the processes necessary to restore him, and when our young men and women see this demonstrated, and they have occasion to perform that great duty, they will know how to proceed.

There will be a demonstration how to stop a bleeding artery. To you men of the medical and dental professions, that may seem simple, and it is simple—anything is simple if you know how to do it; but remember that very few teachers have ever seen how this is done; and also remember that at the sight of human blood, when work of this kind becomes necessary, the layman is apt to become excited and he doesn't know what to do. Definite information and definite knowledge of what to do and how to do it contribute much to that self control and confidence which command success.

There will be a demonstration of how to put a splint on a broken leg or arm; what to do in case of fainting or sunstroke; how to do the right thing in dressing a wound, and the many other demonstrations which a physician knows should be given. These demonstrations will serve the same purpose in teaching how to care for the injured until the doctor has time to arrive that laboratory demonstrations serve in teaching the sciences. After these young men and women become teachers they in turn can give these demonstrations before the boys and girls in their classes, and thus our people will become more efficient in giving first aid to the injured.

I am not an advocate of the teaching of sex hygiene in our elementary schools, but every teacher, whether man or woman, should have such information that he may know there are times when a girl should receive sympathy and relief from her lessons, instead of urging and driving her on to more and harder work; something which I have seen in the schoolroom time and again. He should have such information that he may know if a girl is caught in a rainstorm on her way to the school, it is better that she be sent home, if her home is not too far away, rather than to have her remain with wet feet and clothing, or, if her home be far away, it is more important that she dry her feet and clothing than recite her lessons. And for such reasons as he heard given in the paper read a few moments ago, I claim that we need in these normal courses—remember these are places where we are preparing our teachers—a course in the hygiene of womanhood.

Many of our people fail to appreciate the importance of sound teeth. In the lecture on oral hygiene there will be a trained dentist who will not only be able to tell the people what to do to keep their teeth in good condition, but he will be able to tell them in an emphatic way, by means of illustrations drawn from his actual experience, the terrible consequences of neglect; he can bring to those teachers a great fund of information, information which we cannot get from our textbooks alone.

At the meeting of last June there was appointed a committee to devise a general plan of work and procedure and to make outlines for each of these lectures. These outlines were prepared by specialists in their work, and printed copies will be sent to the physicians and dentists who are to deliver the lectures to these county normal training schools which may be in their vicinity. By having a definite outline, the lecturer will be saved the time and the labor of preparing one for himself. As a result there will be system given to our work so that there will be a similarity of the great work done in every normal school in the state .

By this great philanthropic spirit which you have shown in this great movement, men of the dental and medical professions, you are serving as a great inspiration to our teachers. You will see great results from this work as the days go on. You are helping us who are working as teachers to bring into this subject true methods, so that what has been in many instances toil for the teacher, will be changed into joyful work. With the light you will bring us, you will help us to teach the greatest art of all arts—the art of correct and true living. Through the channels of the public schools you will reach thousands upon thousands of our people, and through your efforts it will be made possible to save many lives from being sacrificed upon the altar of ignorance and neglect. As the years roll on, and this work continues, the people of this state will owe to you for your noble service the greatest debt of gratitude.

Ohio State Dental Board

Columbus, Ohio
August 20, 1915

EDITOR THE DENTAL SUMMARY

Dear Sir:

I beg to call your attention to an advertisement appearing in the August number of THE DENTAL SUMMARY

The said advertisement offers a special course for "Dental Assistants." Two dental schools of this state are graduating young women with the degree of "Dental Nurse." This degree gives no rights under the State Dental Law, and the president of one of the schools is under arrest for employing one of these "Dental Nurse" graduates to do dental operation alleged contrary to law.

Yours truly,
HOLSTON BARTILSON

Michigan State Board of Dental Examiners

The next regular meeting of the Michigan State Board of Dental Examiners, for the examination of applicants who wish to practice dentistry in Michigan, will be held at the dental college at Ann Arbor, beginning Monday, November 1, 1915, at 8:00 A.M., and continue through Saturday November 6th.

For application blanks and full information, apply to

A. W. HAIDLE, *Secy.*
Negaunee, Mich.

Xi Psi Phi Fraternity

Greetings from the alumni Chapter of the State of California and alumni Chapter of Southern California.

During the Panama Pacific Dental Congress, August 30th to September 9th, a Xi Psi Phi Fraternity Booth will be maintained on the floor of the Congress to assist in every way the needs of our visiting members.

Kindly register at the booth upon your arrival so that we all may become acquainted and be of service to one another. Wednesday, Sept. 1st, will be "Fraternity Day."

By order of State of California Chapter.

H. EDWARD GEDGE, *Pres.*
EDWARD J. HOWARD, *Secy and Treas.*

EDITORIAL

Practicing Dentistry Under Difficulties.

We recently received a letter from Dr. Walter Rose, a dentist practicing in northern Ireland, in which he says: "I receive THE DENTAL SUMMARY every month and read it with very great interest. How I wish I had some of your go-ahead dentists as colleagues in this out-of-the-way corner of the world. Just fancy half Connaught (610,000 population) and only two qualified dentists. The rest peripatetic quacks."

He says the financial aspect is all right there, but there is far too much extraction of teeth to suit a man who loves his work and has the best interests of his patients at heart. He also sends a copy of a little booklet on "Oral Hygiene" of which he has issued 10,000 copies, at his own expense, to help educate the people. As a foreword to this little booklet the author says: "Should even a few of the people who read the following, derive any information that will enable them to better safeguard their own and their children's health, the writer will count the hours spared, with difficulty from the claims of a busy practice for the writing, and the few pounds spent on the production of this modest brochure, as not altogether wasted."

The dental law in Ireland specifies that only graduates of recognized Dental Hospitals or colleges can legally use the words "Dentist" or "Dental Surgeon" or the title, L.D.S., yet anyone who chooses, and at the same time possesses enough self-confidence, may, without any previous training or experience, start in practicing and perform—or attempt to perform—any dental operation to which he can induce his confiding patients to submit.

The only protection the public has lies in the fact that the "quack" is forbidden by law to use the title of L.D.S., the word "Dentist" or "Dental Surgeon." The law, however, somewhat inconsistently allows him to call his business premises a "Dental Surgery" "Dental Consulting Room," or "Dental Office," and to place these words after his name, on door plate, or in advertisements. He may also describe himself as a "Tooth Specialist," a "Maker of High-class Artificial Teeth," etc., or he may claim to be the representative of some "Dental Company" or "Dental Institute."

These are the conditions under which the two licensed dentists are practicing. There is no opportunity for intercourse with fellow practitioners. They are hampered on every side by unskilled and ignorant "quacks" who are looking out for the shillings, rather than the welfare of their victims. Their inspiration for higher ideals and modern methods has to come through the dental journals, for which they subscribe.

How differently they are situated from members of the dental profession in well populated districts in the United States and other countries, where dentists have concourse with each other in communities and societies, and aids and inspirations that come from sources other than the dental journals! Yet, handicapped as they are, these dentists are keeping up with the progress of the profession and serving their patients with modern dentistry.

All praise is due the men, who, through handicaps and adverse surroundings, have the ambition and determination to keep abreast of the times that they may give to humanity that service that is subservient to its best interests and welfare.

The Bookcase by your Desk

Yes, we know the chances are—*that you haven't such a bookcase.*

You should have one, however. Either a bookcase or bookshelves where you can keep a file of catalogs of the materials and office appliances now purchased or likely to be purchased for your use. If you haven't room for a bookcase or bookshelves, clear off the top of your desk and file your catalogs there in a classified arrangement.

Dust should never be allowed to collect on these catalogs.

They contain facts which every dentist should know. These facts may make a greater success of your practice. The lack of them may make a failure of it. The practice that is food for the dentist across the street is likely to be poison for your practice. Careful study of these catalogs—serious consideration of their pages—will prevent extravagance and poor buying.

Haste in buying breeds *snap judgment*—the snap judgment which has dismantled more dentists' offices than unfair competition, war, fire and other destructive elements. And the mental insight gained through hasty reading or conversation is not far removed from *snap judgment.* Dependable buying knowledge is gained only through a gradual assimilation of the *possibilities* and *actualities* of different products.

Perhaps you say, "the salesman?" True, he can help you. And the average salesman is honestly conscientious, too,—but here and there are fellows who are expected by their firms *to get the business.* So they go after it—*to make the sale.* The buyer often yields to their enthusiasm and claims because he is only human, with a desire for efficiency, with a confidence in universal man—and with a lack of self-training for the *esponsibilities* of buying

The bookcase by your desk is protection against this kind of buying. Its contents will tell you what manufacturers make the materials and office appliances for you. They will tell you what manufacturers in your field make the materials and office appliances *not for you.* Also they will prime you with judgment which cannot be pierced by the enthusiasm or exaggeration of the personal claim.

So keep the dust off the bookcase—*but do not use the dust rag.* Get your catalogs near you. Where you can lay your hands on them for thumbing over in the spare moment of the day. *Then bring your* catalog file up to date. The advertisements in THE DENTAL SUMMARY smooth the way for you to obtain catalogs of products in which you would be interested at the present time, or *in the future.*

Write the manufacturers for these catalogs

Writing for a catalog does not obligate you to buy immediately. It places you only under obligation to read—to give the manufacturer a hearing—and not to throw away the catalog.

This you should be willing to do for the sake of your efficiency.

The Knocker

When the Creator had made all the good and beautiful things, in order that they might be truly appreciated, He then made the beasts and reptiles and poisonous insects.

When He had finished He had left over scraps that were too bad to put in the Rattlesnake, the Hyena, the Scorpion or the Skunk; so He placed all these together, marked it with a Yellow Streak, and called it a Knocker.

Then, as a compensation for this fearful product, He took a sunbeam and put it in the heart of a child, the love of a Mother, the brain of a man, wrapped these in civic pride, covered it with brotherly love, gave it a mask of velvet, and a grasp of steel, and called it a Booster.

He made him a lover of fields, and flowers, and manly sports; a believer in equality and justice.

Ever since these two were created, mortal man has had the privilege of choosing his associates

Here's Another

After God had finished making the rattlesnake, the toad and the vampire, He had some awful substance left with which He made a Knocker. A Knocker is a two-legged animal with a cork-screw soul, water-logged brain and a combination backbone made of jelly and glue. Where other men have their hearts, he carries a tumor of decayed principles. When the Knocker comes down the street, honest men turn their backs, angels weep tears in Heaven and the devil shuts the gates of Hell to keep him out.

Cherry Pits "Not Guilty"; Germs Cause Appendicitis

No longer will the carelessly swallowed cherry pit or the habit of eating grapes, seeds and all, rest under the stigma of being the primary causes of appendicitis. For Dr. Edward C. Rosenow, of the research board of the Memorial Institute for Infectious Diseases, has published a report in which he gives the results of experiments showing that appendicitis is brought about by the germs which infest decayed teeth, or are present in the mucous membranes of the air passages during "sore throat."

Doctor Rosenow's work is published in the latest issue of the *Journal of Infection Diseases.* It is an attempt to disprove the old notion that appendicitis is an inflammation of the intestinal "blind alley," called the appendix, caused by the presence in it of indigestible foreign matter.

Doctor Rosenow reached his conclusions by experiments with rabbits.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

Warning

We have received a number of complaints from dentists residing in sections of Ohio. Pensylvania, Michigan and West Virginia, who have given orders to agents representing themselves to be employed by Weissfeld Bros.

Nearly all of these dentists have paid in full for merchandise which they ordered from such agents. Many others have given 50% deposit of the amount on the order.

We have no agents who are allowed to collect in full or to collect 50% deposits. We are sorry for those dentists who have given those orders for they have been taken advantage of by some crooked person.

Our agents who have the authority to collect are those that bear credentials from us signed by a Notary Public of New York City, and those agents bearing those credentials have only the authority to collect a deposit of 20% on the order.

All dentists in general are warned not to pay any money to agents who do not bear such credentials.

Yours very truly,
WEISSFELD BROS.

WHAT SOCIETIES ARE DOING

Pennsylvania Law Will Be Vigorously Enforced

Harrisburg, July 17.—The State Examining Board has announced that the new dental law provides that prosecutions for the illegal practice of dentistry shall be a part of the duties of that board, the funds for which are to be obtained by the annual registration fee of one dollar imposed on each dentist practicing in Pennsylvania. The board contemplates a vigorous campaign in prosecuting all those now violating the law. Every dentist is required to register with the secretary of the board before January 1 next, and annually thereafter. The blanks will shortly be issued.

South Dakota—State

Rapid City, July 30.—At the last session of the annual convention, Sioux Falls was selected as the next place of meeting and officers were elected as follows:

President, C. C. Fleischer, Sioux Falls; vice-president, Harry Donahoe, Sioux Falls; treasurer, John Donahoe, Sioux Falls; secretary, F. T. Armstrong, Sioux Falls.

Resolutions embodying a memorial for members who have died during the past year were adopted. The list includes Doctor Duncan, Gregory; Doctor Grount, Beresford; Doctor McCartney, Mitchell.

Montana—State

Helena, Mont., July 23.—After selecting Lewistown as the next place of meeting and electing officers the Montana Dental Society adjourned Saturday after what is declared to be the most successful session in its history.

Officers were elected as follows: President, D. J. Wait, Helena; first vice-president, R. L. Spaulding, Helena, Mont., second vice-pres., R.R. Johnson, Great Falls; secretary, Frank Adams, Billings; treasurer, George H. Chose, Great Falls; superintendent of clinics, Frank J. Bell, Billings; executive committee, G. M. Hollenbeck, Lewistown, F. E. Price, Lewistown and F. W. Adams, Billings.

Iowa—Fort Dodge

Spirit Lake, Ia., Aug. 10—The new officers of the Fort Dodge district are J. E. Anderson, of Paton, Ia., president; D. E. Lyon, of Jefferson, Ia., secretary; T. E. Brunser, of Ogdem, Ia., treasurer.

Dental Law for Alabama

Montgomery, Aug. 4.—(Special.)—The senate this afternoon passed the dental bill, advocated by the dental association of the state, a measure which requires that a board of experts be created to examine all applicants for the practice of dentistry.

On the Care of the Eyes

Many eyes are injured or lost from disease contracted in certain occupations. In some trades absorption of poisons produce serious eye diseases. Among those poisons are tobacco, alcohol, lead, bisulfid or carbon, nitro benzol, aniline dyes, etc. One of the most dangerous is alcohol, not the high-grade grain alcohol, but the cheap wood or methyl alcohol, sometimes masquerading under the name "Columbia spirits," "Colonial spirits" or "Manhattan spirits." This poison is sometimes drunk by ignorant persons, and not infrequently causes death and blindness. Even ten drops have produced such results in susceptible persons.

Turkish bath attendants and masseurs sometimes use wood alcohol with bad results, both to the rubber and the rubbed. The inhaling of wood alcohol in such trades as painting and hat making not infrequently produces blindness or fatal results. It is used as a solvent for shellac and if used in confined spaces is very dangerous. In a pencil factory where wood alcohol was used, a roomful of girls suffered from serious disturbances of vision, which passed away with the removal of the cause.

"Wood alcohol under this or under any other name should not be manufactured or sold," says The Journal of the American Medical Association. "It is too dangerous. What is called denatured alcohol is just as cheap and comparatively harmless. And other vocational eye disturbance is found where eyes are unduly exposed to very bright lights, such as 'blow-outs' or 'short-circuits,' where the light is sudden and intense. Such accidents may, by the overpowering influence in the retina, produce poor sight or blindness, partial or complete, for a variable length of time. Constant and intense electric light produces retinal exhaustion, and an excessive pupilary contraction, which secondarily overworks the muscles of accommodation, and occasions great ocular fatigue.

"People who work continually on polished surfaces, such as gilders, metal polishers, and glass workers, experience the same troubles. Factories that are over brilliantly illuminated by incandescent, gas, and electric lights are apt to injure the eyes, as these lights contain much of violet and ultra-violet rays, which produce an effect on the eye similar to 'snow blindness.' These rays may also seriously affect the eye. Stokers, bottle-makers, and glass-blowers, whose eyes are continually exposed to intense heat and light, are very apt to have cataracts, and the eye nearer the fire is always the one first affected.

"Another kind of occupational eye disease can be found in people who are compelled to work for hours at a stretch, on work that requires close inspection of small things. Bookkeeping, drawing, watch-making, sewing and dentistry, all close work, require a strain of the muscles of accommodation, even if people have normal eyes.

"Many people have errors of refraction for which glasses should be properly fitted, there is still an accommodation strain where the eye is unwisely taxed. This accounts for the headache, tired and red eyes and nervous exhaustion so frequently seen in those who work long and hard at occupations requiring close visual exertion, and where at the same time perhaps the light is poor and badly arranged.

"Shortsightedness is a disease aggravated by the close use of the eyes and is found in students, typesetters, etchers and engravers, in fact, in any vocation where close and continuous use of the eyes is demanded. The proper adjustment of glasses is essential in such cases, as well as health up-building, open-air life, proper lighting and the judicious use of the eyes, for it must be remembered that shortsightedness is a progressive disease and sometimes causes blindness. Shortsighted people should endeavor to secure some occupation which does not require the close and continuous use of the eyes.

2000 Happy Kids

More than 2,000 sets of pearly white teeth shine when St. Paul, Minn., children smile. Six months ago, because their parents could not afford to pay the price, these teeth were gnarled, unlovely and uncomfortable, but today they illuminate the happy smile.

Such a transformation would be an achievement for a corps of dentists. Merely to get a youngster into a dentist's chair is a task which many a St. Paul mother has proven unequal to. But it is what Dr. James Henderson and Dr. W. B. Stone of the free dental dispensary, 204 West Ninth street, have done since the beginning of the year.

Every afternoon the girls and boys flock into their office. Many with scared faces, boys just off the diamond, with ball gloves yet strapped to their belts, and girls yet warm from a game of jumping rope. From the far corners of the city, fifty or more every day troop into the big red building, to come out later, happier and healthier for the work that is being done.

An Exception

"A man always suffers when he hunts for trouble," said the amateur philosopher.

"Oh, I don't know about that," replied the professional cynic. "How about the dentist?"

ROBBERIES

Four dental offices in Rockford, Ill., were raided by burglars, August 8; gold and opiates valued at about $200 were stolen.

Gold and platinum worth $100 were stolen from three dental offices in Beloit, Wis., August 8.

The office of Dr. F. C. Henderson, Stoughton, Wis., was robbed, August 13, of $50 in gold; Dr. F. C. Myers $60.

Dr. Charles N. Hoagland, Elgin, Ill., reports the loss of $125, gold, August 9.

Grand Rapids, Mich, Aug. 3 —Burglars who specialized on dentists' gold plied their trade in an expert manner in the Gilbert block Sunday, looting a number of offices after prying an entrance.

Dr. Ward Moore, located on the second floor of that building, was the heaviest loser, according to the reports from his office. The thieves secured about $200 worth of scrap and new gold to be used in dentistry work. Nothing else was taken. Dr. E. W. E. Paterson, occupying the same offices escaped loss.

Dr. R. Gordon Gix, room 603, lost about $30 worth. Dr. Thomas Hudson, same place, lost a similar amount. Dr. H. C. Fiebig, room 503, lost $35 worth of gold and Dr. Ben H. Lee's loss is given at $30. The offices of Dr. B. Crandall, room 403, where the gold was kept in a safe, were not looted. While the officers think that various other offices were entered nothing has been reported as missing.

The work evidently was that of experts and was probably done over Saturday and Sunday nights. No clews were left for the officers to follow.

Burglars were busy in Toledo during last month. Drs. Barber, Kuebler, Graves, Dierks, Megginson and others report losses.

Dr. J. W. Stamp, Elkhart, Ind., reports loss of $75, gold, August 7.

Many reports reach us of the theft of cocain, novocain and other anesthetics. In one case a bottle of strychnine tablets. Thieves also are beginning to steal Harrison-Law blanks, doubtless for the purpose of obtaining supplie—s of their favorite dope.

Saginaw, Mich.—The police believe the burglary of four dental offices recently was the work of a gang of professionals who went through a number of offices in Flint and made just as much of a clean getaway as they seem to have accomplished here. About $275 worth of gold was taken. The Flint police failed to notify the Saginaw officers of the burglaries as is the customary rule in interchange of police information.

The offices visited here were: Dr. T. E. Howson, Dr. F. E. Bush, Dr. H. E. Gerber and Dr. H. H. Madigan.

DEATHS

Will subscribers kindly report deaths occurring in their neighborhoods? Reports should reach us by the 15th of each month.

At Abilene, Texas, July 21, Dr. S. J. Ramsey: suicide by shooting.

At Hannibal, Mo., July 21, Dr. E. D Ireland, aged 73. He was one of Hannibal's prominent citizens and a pioneer dentist.

At Minneapolis, Minn., August 1, Dr. L. W. Nevius, aged 69, as the result of an automobile accident.

At Chicago, Ill., August 12, Dr. Alden R. Newlin, of apoplexy. He was a direct descendant of Nicholas Newlin, a close friend of William Penn, and Thomas Newlin, one of the most famous preachers of England, is his cousin.

French Politeness

As a truly polite nation the French undoubtedly lead the world, thinks a contributor to a British weekly. The other day a Paris dentist's servant opened the door to a woebegone patient.

"And who, monsieur," he queried in a tender tone, "shall I have the misery of announcing?"

Fun of Dentistry, If Any

A girl from the country who had recently come to town to work, and who was busy all day, went to a dentist one evening to have him extract a tooth which had been troubling her. She asked him what he would charge for the operation.

"Five dollars with gas, two without," was the answer.

"Oh," said the girl, "then I'll drop in tomorrow and have it out by daylight."

The Toothbrush Habit

When did the English first adopt the tooth brush habit, which is now being denounced by certain medical authorities? In "Esmond" Thackeray makes Lord Castlewood spend "a tenth of his day in brushing his teeth and the oiling of his hair, and in doing so the novelist commits a double anachronism. During the first half of the eighteenth century all fine gentlemen wore wigs and had no use for oil on their hair, whilst the tooth brush was so late as 1754 unknown to Lord Chesterfield. Writing to his son, Chesterfield say: "I hope you take great care of your mouth and teeth, and that you clean them well every morning with a sponge and tepid water, with a few drops of arxuebusade water dropped into it. I insist upon your never using those sticks, or any hard substance whatever, which always rub away the gums and destroy the varnish of the teeth."—*London Chronicle.*

Normal saliva is the mouth-bath and mouth-wash which nature provides for the protection of the teeth and gums. The habitual employment of akaline dentifrices, the action of which interferes with the production or quality of this important fluid, is a procedure detrimental to oral health.

LISTERINE

Listerine is an efficient, non-poisonous, unirritating antiseptic solution, especially adapted to the requirements of

DENTAL PRACTICE

To cleanse and deodorize before operating
To wash and purify the mouth after extracting
To treat, antiseptically, diseases of the oral cavity
To prescribe as a detergent, prophylactic mouth-wash

LISTERINE is prescribed by dental practitioners as a mouth-wash for daily use in the care of the teeth, to secure that measure of antiseptic influence which has proven so desirable in combating the acid-forming bacteria of the mouth.

LISTERINE because of its mildly acid reaction and aromatic flavor, stimulates the flow of normal saliva so necessary to the maintenance of a healthy condition of the oral cavity.

LISTERINE should be used as a mouth-wash after employing frictional chalk dentifrices, to neutralize the depressing effect exercised upon the salivary glands by these alkaline or anti-acid substances, and to effectually remove from the mouth all particles of these insoluble and irritating materials.

LISTERINE leaflet. upon the teeth and their care, suitable for distribution to patients—emphasizing the importance of frequent consultation with the dentist—supplied with dentist's card imprinted on cover in lots of 200 copies upon request.

LAMBERT PHARMACAL COMPANY
2101 Locust Street St. Louis, Mo.

ORGANIZE DENTISTS' SQUAD

Canada to Send 150 to Front to Care for Soldiers' Teeth

That the teeth of the soldiers in the field are not to be neglected is evidenced in the fact that a company called the Canadian dental corps is being organized and will soon be sent to the front. The company comprises dentists from all parts of Canada who are prepared to drill for service with the different units in the Canadian expeditionary forces.

The new dental corps, which is being formed at Ottawa, will be enrolled as a regular military unit, and the officers will have full rank. However, it will not see service as a corps, for when it reaches France it will be divided, with two dental officers going to each military unit in connection with the army medical service. Some will be sent to hospitals and elsewhere.

In view of the fact that some of the soldiers have been on active service for nearly six months, with practically no opportunity to have their teeth attended to, it is believed that there will be a great deal of work for the dentists.

Keep Your Harrison-Law Blanks in the Bank

Minneapolis, Minn., July 26—Drug robbers revealed a new plan of getting opiates for themselves in the robbery of two dental offices in the Masonic temple today. They stole a book of blanks used by the dentists to obtain opiates for use in their practice.

The robbers broke into the office of Dr. N. B. Patten, 417 Masonic temple, and Dr. C. J. Plonske, 412 Masonic temple. From Doctor Patten they stole a book of opiate blanks, dental gold worth $5 and then, apparently angered at their failure to find either money or opiates, they tore up his cash book and scattered the bits around the floor. The door was smashed in.

Doctor Plonske said he could not learn that anything was stolen from his office, though his books and papers were strewn about the floor. The robbers had apparently searched for more blanks which they could fill out with forged names and use to obtain the drugs.

Standardize Dental College

Cedar Rapids, July 28.—The state board of education has voted to standardize the college of dentistry at the University of Iowa. A four-year course will be established and maintained after September, 1917.

It Is to Grin—Maybe

"Did you see where a man swallowed a dentist's drill?"

"Gee! It must have got on his nerves."

Ohio Health Campaign

If you do not ventilate turn that "Home Sweet Home" motto to the wall. No unventilated home can be sweet.

The Ohio State Board of Health has resorted to striking epigrams of which the above is an example, in order to bring their campaign for the prevention of disease more forcibly before the residents of our section of the state.

The board has arranged to show its unique traveling health exhibit under a large tent at various county fairs.

The exhibit will be accompanied by the director and visiting nurse who will explain the numerous models and, through pamphlets and personal work, will endeavor to give all visitors a better idea of the possibilities of preventing disease through modern methods of sanitation. Scattered through the exhibit will be a large number of epigrams, from which the following are picked at random:

"Prevention will save more lives than cure, and it is far cheaper."

"To nail your bedroom window shut is to drive a nail into your coffin."

"It is more important to brush the teeth after each meal than to wash the face on rising."

"There is less danger in vaccinating a person than cutting his corns."

"Is your health officer appointed because he is an efficient guardian or because of a political pull?"

"Do you visit a dentist twice a year or do you wait until your teeth drive you to him?"

"Tuberculosis is catching. Anyone can catch it. No experience is necessary."

"Babies are like plants. They cannot thrive without plenty of sunlight and fresh air."

Visit the health exhibit at the fair; it will be well worth your while.

Just Found It Out?

An arrangement has been made by the state board of dental examiners with the state board of control for clinics at the Walla Walla penitentiary. Applicants for license as dentists will demonstrate their skill on the convicts. Presumably this form of capital punishment does not come within the prohibition of the law enacted by the legislature a few years ago. But, seriously speaking, the arrangement may prove advantageous to the state, to the dental board and to the convicts. Good teeth have a good deal to do with good conduct and health.—*Daily Press.*

Painless

Smith— I thought you said it wouldn't hurt.

Dr. Burrhard—Does it hurt? I haven't felt a thing yet.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV OCTOBER, 1915 No. 10

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

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L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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Foreign, U. P. U. Countries, $1.75. **Advertising Rates on Request**

Neither the editor nor publisher is responsible for the views expressed by authors in the reading matter published by THE DENTAL SUMMARY

REGULAR CONTRIBUTIONS

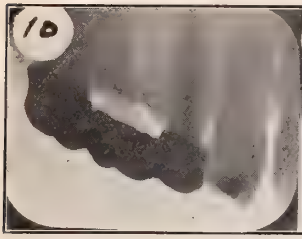
DENTAL RADIOGRAPHY

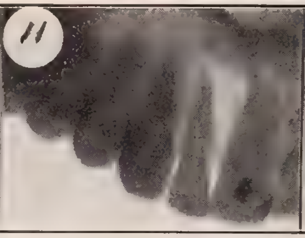
BY GEORGE E. JOHNSON, D. D. S., FORT WAYNE, IND.

THE CORRECT READING or interpretation of dental radiograms is a science which requires an exhaustive study of the anatomy and pathology of the teeth, jaws and associate parts, the treatment of pulpless teeth and alveolar abscesses, the technic of root filling, crown and bridge work, and last but not least, the variability of the normal anatomical structures and difference in density of the alveolar process.

To understand pathological conditions we must first make an exhaustive study of the variable anatomy of the jaws and teeth in health. We find a range of normal density of the alveolar process from a very little greater than the soft tissues up to and exceeding the density of tooth structure; so that sometimes in making radiographs through the external

Fig. 10 shows a section of the palatal root of the first upper molar under a bridge. This case was operated upon by a nasal specialist for empyemia of the antrum, the perforation being made through the nasal wall into the antrum, with negative results. The writer removed the root through the palatal wall without disturbing the bridge, and all evidence of antrum trouble disappeared.





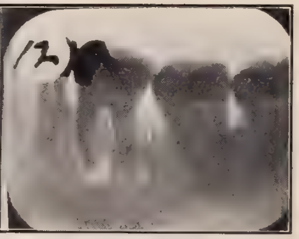
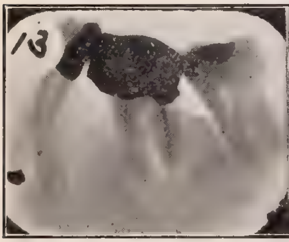
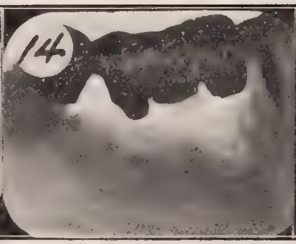


Fig. 11 shows a case of pericemental abscess in which necrosis of the approximal wall of the socket has gone so far that the destruction of both central and lateral were threatened; but by prompt operation, trephining into pus pocket and surgical curettement, we succeeded in stopping the necrotic process. This was a case in which the pulp in the central was still living, but afterward devitalized.





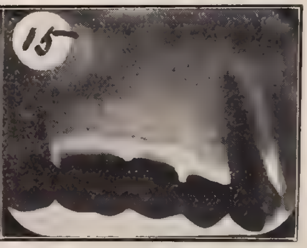
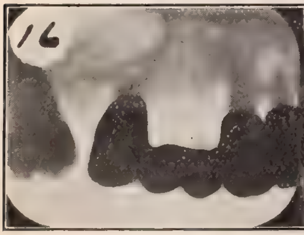
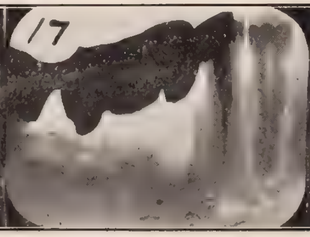


Fig. 12 shows an abscessed lower first molar.

Fig. 13 shows a lower first molar abscessed, and about one-third of the apical end absorbed, with root filling protruding.





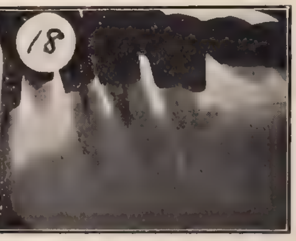


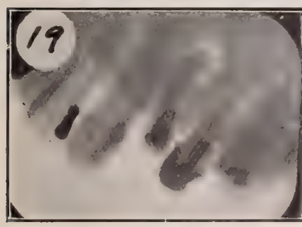
Fig. 14 shows an extensive absorption of the alveolar ridge under the bridge, but no infection around the teeth.

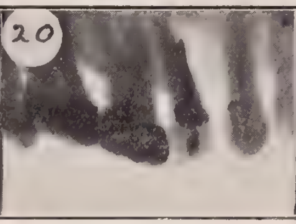
Fig. 15 shows also an extensive lessening of density above the bridge, in the process. Notice the small size of the antrum near the second molar.

Fig. 16 shows an extensive absorption of the alveolar ridge, with two well-defined alveolar abscesses, one emptying into the antrum of Highmore.

Fig. 17 shows a perfectly filled root, without any marks of infection, but with an extensive absorption of the alveolar ridge. Notice the structure of the alveolar process, and also the mental foramen.

Fig. 18 shows an extensive absorption of the alveolus, and also three teeth infected at their apical ends from imperfect root fillings.





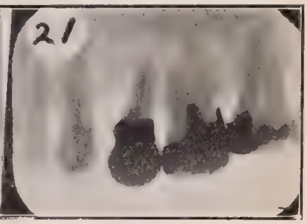
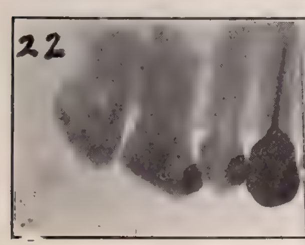
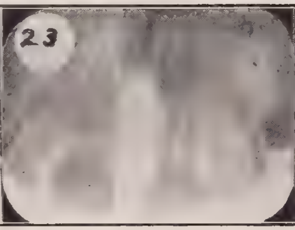


Fig. 19 shows you an alveolar abscess at the apical end of the first bicuspid.

Fig. 20 shows a second bicuspid with a Logan crown post penetrating the process through the side of the root, setting up an abscess and consequent necrosis of the socket wall.

Fig. 21 shows you how well nature has made the repair after two years from the time the crown and post were removed, the "*post hole*" filled and abscess treated.





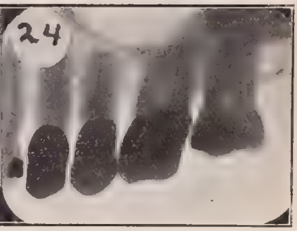
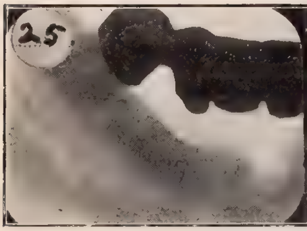


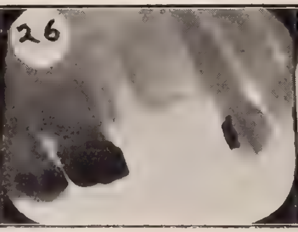
Fig. 22 exhibits a well-filled root canal, and a strange but not infrequent porosity of the socket wall between the roots of the teeth.

Fig. 23 shows a very rare condition known as a "Lip Tie." There is an imperfect union of the bilateral halves of the superior maxilla at the symphysis. Every movement of the lip helps to prevent ossification or union by drawing the frenum through the interdental space. This case required surgical interference and electric cautery, with subsequent adjustment of an arch-bar.

Fig. 24. This illustration shows the beautiful definition of the structures of process, antrum, pulp canals, tooth roots and gold crowns.

Fig. 25 shows extensive absorption of the alveolar ridge, the inferior canal, and a beautiful tapering off of the body of the maxilla at its base.





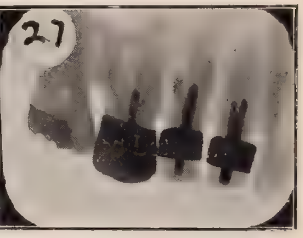
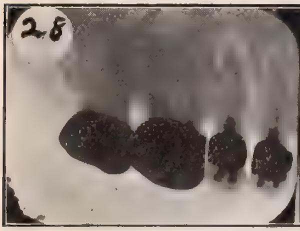
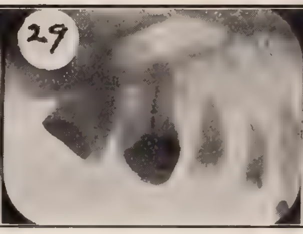


Fig. 26. Here we have the open socket of a recently extracted second bicuspid, and the structure or density of the process where the first bicuspid was extracted some ten years ago, showing how well nature has made the repair.

Fig. 27 shows a very rare condition, known as a peridental calculus. This is evidently a tubercular cryptogamic infection of the peridental membrane. It is an affection in which it is necessary to trephine in order to reach the deposit. The writer has found and operated several cases.

Fig. 28 is a blind alveolar abscess of the progressive and pernicious type, as will be seen in the plate following. Having been treated by all known methods without avail, it was finally cured by the use of a standard formalin preparation, Oxpara.





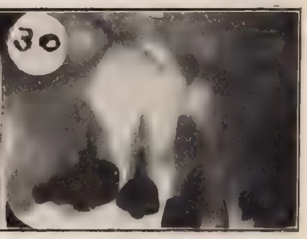


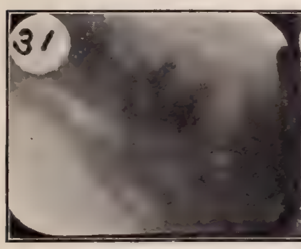
Fig. 29 shows the case in its pernicious stage.

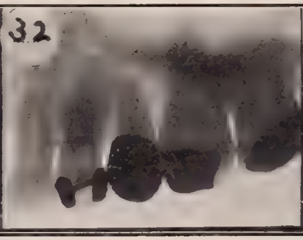
Statements have been repeatedly made of late that formalin is a dangerous antiseptic, destroying live cells and leucocytes, rendering the parts treated more liable to infection, initiating absorption, lessening the density of the alveolus, etc., thereby defeating the very object of its use. I have here some plates that will disprove such statements, when the material is used with discretion, as all such remedies should be used.

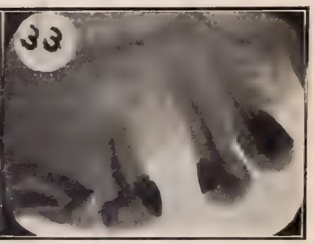
Fig. 30 is a blind alveolar abscess of a pernicious type, which resisted all treatment until the writer trephined through both the labial and palatal walls, and also amputated the apical of the lateral incisor.

A packing of iodoform gauze was used for two weeks, at the end of this time use of gauze was discontinued and abscess allowed to close. At present writing, two months after operation, it is under control and seems to be cured.

Fig. 31 is a case of localized osteomyelitis of the inferior maxilla, which the writer operated on, removing all necrotic tissue with a bone curette, leaving only a small portion of the body of the maxilla (no larger than a lead pencil) as a frame work for the osteoblastic reconstruction.

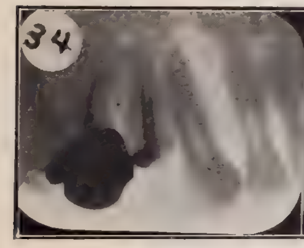


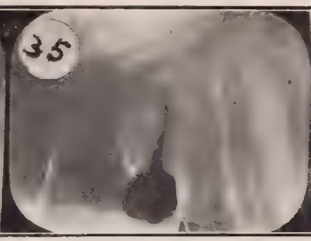




At present writing, one year after the operation, patient has a good, strong jaw, a very little larger than the bone on the opposite side.

In Fig. 32 we have a case which resisted all forms of "regular" treatment until the root of the second bicuspid was amputated, followed by treatment with a formalin preparation.





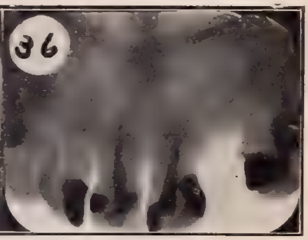


Fig. 33 shows a case in which the pulps of three teeth were devitalized, removed, and the canals packed with Oxpara for over a year. Please notice that they are now in perfect health, without any of the marks of lessened density of the alveolus, and without the least trace of infection. In short, they are perfectly normal.

Fig. 34 shows other teeth which were treated in like manner, and are now entirely normal.

Figs. 35 and 36 exhibit other teeth that were devitalized and packed as were the foregoing, with no unfavorable results.

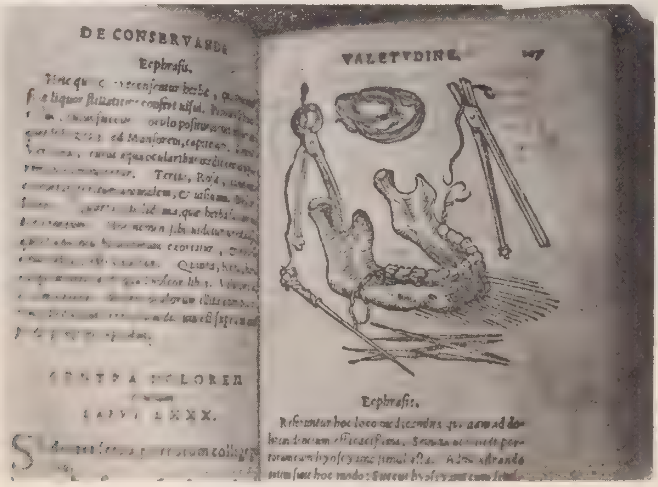
In Fig. 37 we have a first bicuspid which was devitalized two years ago and packed as were the foregoing, and the pulp still remained in the tooth when this plate was made. There is not the slightest indication of infection, nor are surrounding tissues in any manner affected.

In the light of what has been said above and the examples supplied, readers of The Dental Summary are now in position to judge and decide for themselves which it is that produces a breaking down of the alveolus and consequent lessening of density—infections, or modern root dressings.

THE PRINCIPLES OF VACCINE THERAPY AND WHY IT SHOULD BE USED IN THE TREATMENT OF PYORRHEA*

BY GEORGE BAILEY HARRIS, D. D. S., SC. M., AND MR. E. M. STANTON
BACTERIOLOGIST FOR PARKE, DAVIS & COMPANY

THE SUBJECT OF VACCINE THERAPY covers such a large field that it is impossible to cover in one paper all its phases. There are a great many important subjects related to vaccine therapy that cannot even be mentioned, nor can the surgical treatment be considered; but because of this omission we do not desire to have the idea conveyed that it is not important, or that we do not approve of local surgical treatment. Vaccines should not be considered a substitute for surgical treatment, but rather an adjunct to it.



DE CONSERVANDA

Ecphrasis.

VALETVDINE.

Ecphrasis.

Fig. 1

Pyorrhea is not a modern disease, as it is sometimes supposed to be. Fig. 1 shows the method of ligating the teeth as taught in the first medical college founded in Europe. This picture was photographed from a cut in the "*Boni de Conservenda Valetudine*," published in Paris in 1553. This book is a copy of the original "*Boni de Conservenda Valetudine*," which was the text book used in the School of Salernum, Italy.

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*Read before the Michigan First District Dental Society.

Vaccine therapy is founded upon the principles of immunity, which must be established before recovery can take place from any infectious disease. In order to better understand vaccine therapy, therefore, we must have a clear conception of immunity and how it is brought about, both artificially and naturally. Immunity has been defined as insusceptibility to disease which is generally of an infectious nature. An infectious disease is one which is produced by a living organism, and is capable of being transmitted from one individual to another, pyorrhea being no exception. It is an infection in contradistinction to an intoxication, in that the agent which causes the disease is a chemical substance, either of extraneous nature or elaborated as the result of the aberration of body metabolism.

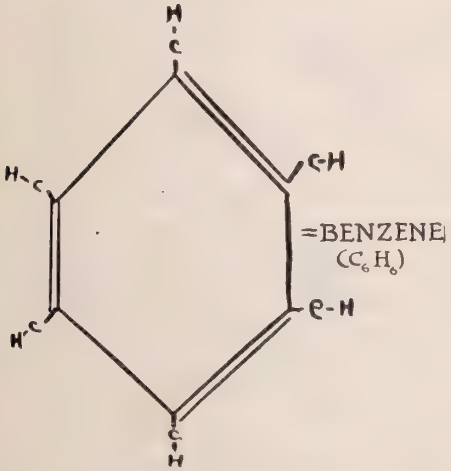

Fig. 2

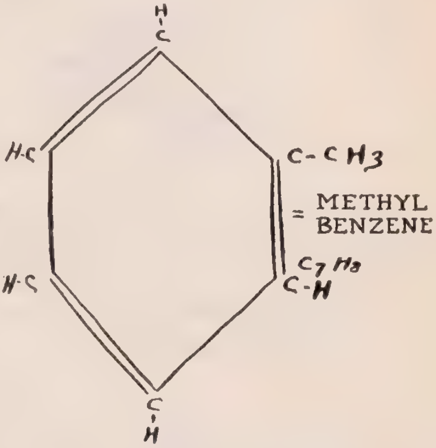

Fig. 3

Immunity may be classified as 1, Natural; 2, Acquired; such as recovery from disease or as the result of immunizing agents, which might be termed artificial. Unless recovery takes place or the body cells respond to the immunizing agents no immunity can be established, whereas if an artificial immunity can be established during the infection, recovery will follow. Artificial immunity can be produced by bacteria, bacterial products or immunizing serums. For the therapeutic and prophylactic immunizations the most generally employed products are serums and vaccines.

Before taking up the subject of vaccines, let us consider Ehrlich's side-chain theory and see just how the leucocytes are affected by these immunizing substances. Every living cell is composed of a dominating nucleus and receptors (side-chains). In organic chemistry the benzol series with its ring is a paradigm to this. The receptors of a cell are of many different kinds and serve usually to anchor and assimilate food stuffs.

At times, however, these cells, by means of these receptors, anchor substances which are not foods but their poisons. When this takes place, the receptors cannot again be separated from the poison and the receptors anchored to them are cast off by the cell. When the limit of anchoring of receptors by toxins has taken place the cell perishes, and if a sufficient number of cells which have a vital function to perform are destroyed, the organ so affected becomes irreparably damaged. This is exactly what takes place in pyorrhea. When a sufficient number of cells of the alveolus are destroyed, the loss of the teeth follows. Moreover, surgical treatment alone or the use of such agents as acids, astringents or caustics will not prevent this anchoring or destroy the toxins.

These receptors are of three kinds: First, Second and Third Orders. Receptors of the first order are simple in construction and combine with substances which can be easily anchored to them. The toxic products of bacteria anchor to receptors of this order. This receptor consists of only one haptophore group and combines directly with the haptophore group of the bacterial toxin. It represents the type of receptors on which is based the action of bacterial toxins and the formation of antibodies.

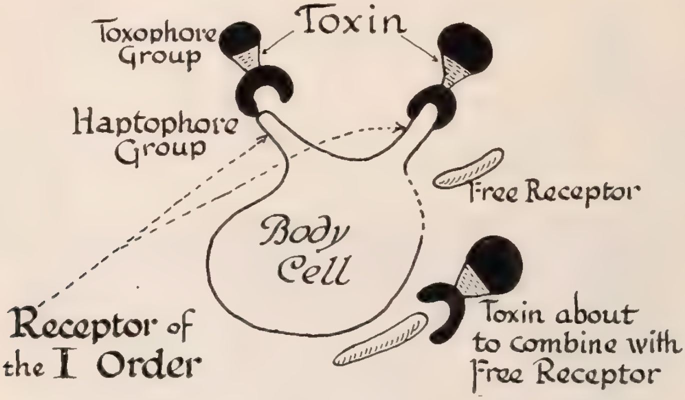

Fig. 4

The receptors of the second order (Fig. 5) vary from those of the first in that they have in addition to the haptophore group the zymophore group. The receptors of this group act on the larger food particles, making them more readily assimilated. In a similar manner they act on the bacterial cell. Receptors of this kind, possessing haptophore and zymophore groups, are broken off from the cells and circulate in the blood as agglutinins and precipitins and after immunization by the injection of bacteria or other products. The haptophore group of the immune body is represented in an agglutinating or precipitating serum which, combining with the bacterial cells, brings about the precipitin or agglutinating reaction. The zymophore group, however, does not combine with but exerts its influence entirely through the haptophore group. The zymophore group is destroyed by such agencies as age, acids and heat.

Receptors of the third order are also adapted to the anchorage of bacteria. These receptors have two combining groups, the one for food substances or cells, the other for substances which act through the receptors; they produce a ferment like action. This latter substance is called an activating substance and is present in normal sera. It is known as the complement. This complement is easily destroyed by ageing, acids and heat. They are destroyed at 55 degrees Cent. When the receptors of this order are anchored by bacteria in numbers not sufficient to kill the cell but to stimulate it to over-production of receptors, the extra receptors are thrown off. These receptors constitute the immune body, or amboceptor. They have two combining or haptophore groups, the one combining with bacterial or other cells and substances called the "cylophylic" group; the other combining with alexin or complement, called the "complementophore" group.

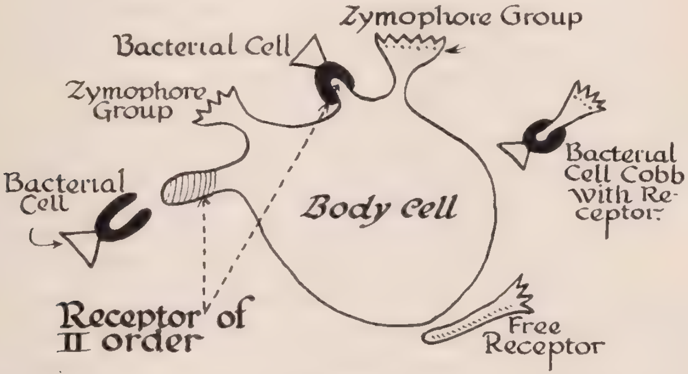

Fig. 5

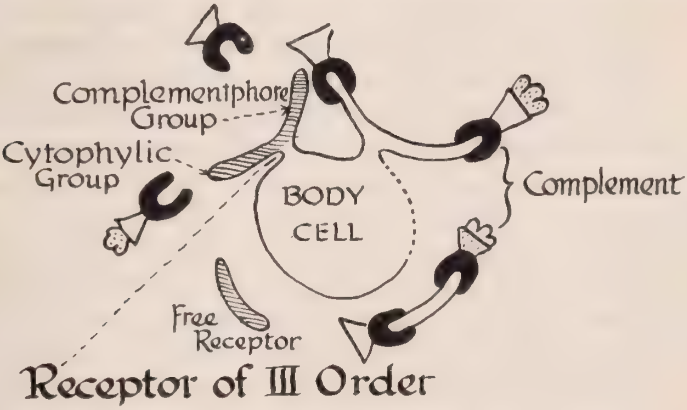

Fig. 6

It is by means of the complement that the amboceptor is able to dissolve bacteria, red blood cells and other substances. Immune sera containing receptors of the third order are bacteriolytic, hæmolytic, or cytolytic, depending upon whether they, together with complement, are able to dissolve bacteria, red blood cells or other cells.

You will notice that receptors of the first, second or third orders can be produced in excess to form immune body or anti-bodies.

PHAGOCYTOSIS

In infection under ordinary conditions leucocytes migrate into the region of the infection, ingest and remove the invading bacteria. This action is termed phagocytosis, and the cells performing it the phagocytes, the principal ones being the polymorphonuclear and the large mononuclear leucocytes, and the endothelial cells of the tissues. Under certain conditions this process does not take place and it is generally less active in localized infections. This may be due to the deficient supply of anti-bodies, owing to the limited absorption. The absence of anti-bodies in pyorrhea is very common. The absence of these immunizing substances may be due to a general run-down condition or the infection may be walled off, preventing their coming in contact with bacteria. In this case it may be overcome by simply breaking down the wall by instrumentation. The deficiency of anti-bodies may be overcome by means of vaccine treatment. If the serum of an immunized animal be injected into a non-immunized one, the phagocytes in the latter are then able to ingest virulent organisms to a greater extent than before the injection.

The effect of this immunization must be partly due to something generated in the plasma or serum which heightens the activity of the leucocytes and other phagocytic cells. This is produced by certain substances termed "stimulins." The existence of stimulins can easily be proven. For instance, washed leucocytes without serum are not phagocytic, but as soon as normal serum is added to them they become phagocytic; but if the serum is heated to 60 degrees C. for fifteen minutes before being added to the washed leucocytes, phagocytosis will not take place. Therefore, the substances inducing phagocytosis are in the serum and are destroyed by heat. Moreover, the action of the serum in inducing phagocytosis is exerted on the bacteria as well as on the leucocytes, rendering them suitable prey for the phagocytes. These substances, which so act on the bacteria, are called opsonins. When dead cultures are injected into the blood of an animal, more than a sufficient number of these opsonins are liberated to prepare the bacteria injected for phagocytosis and they will prepare the same organisms for the process whether the infection be called pyorrhea or any other term.

Furthermore, these opsonins will continue to be liberated for some time after the injected bacteria have been destroyed. As far as the opsonins are concerned, the injection of killed cultures of bacteria is comparable to a general infection.

OPSONIC INDEX

A valuable aid in determining the nature of an infection may be had by taking the opsonic index. It also proves quite valuable in determining the doses of the vaccine and when they may be safely discontinued, but the opsonic index is not essential to successful vaccine therapeutics.

It is difficult for surgical treatment alone to change such a condition. The one way it can be done is by producing an artificial immunity by the use of bacterial vaccines.

There are cases of pyorrhea where there is apparently no pus and there might be some question as to whether vaccines were indicated in these cases. If the opsonic index were taken in these cases it would be found low toward streptococcus. Again, if a culture were obtained it would likely be a pure culture of the streptococcus, showing it to be a streptococci infection. These organisms succumb to vaccine treatment quite as readily as does the staphylococcus.

Under certain conditions the power of the serum for inducing phagocytosis varies greatly, while this variation is slight in normal serum. Active immunization with a bacterial vaccine, or a natural infection, changes the opsonising action of the serum towards the organism injected or of the infection. This variation is determined by making a mixture containing the serum of the injected or infected person, washed leucocytes and a suspension of the micro-organism in question, incubating at blood heat for from five to fifteen minutes and then preparing stained films. A control is prepared by using the serum of a normal person the same leucocytes and bacteria suspension and preparing stained films.

Both films are then examined under the microscope and the number of micro-organisms ingested by fifty or one hundred polymorphonuclear leucocytes are counted in each of the two films. The ratio of the number of organisms in the film prepared from the serum of the infected of injected individual to that in the film prepared with the normal serum gives a figure, the opsonic index, and if the number of organisms in the normal serum film be taken as ninety, the individual will have a figure above or below ninety. For example, if a healthy person be injected with a vaccine consisting of 280,000,000 bacteria, the number used in the pyorrhea vaccine, and if the serum be examined in this way five to seven days later, the film preparation might show 300 cocci ingested by 100 polymorphonuclear leucocytes, while the film prepared under similar conditions with normal serum might show only 200 cocci ingested by the same number of leucocytes. The ratio is therefore 300; 200 or 300-200, and if the normal be taken as unity this gives the figure 300-200 times $1 = {}^{3}/{}_{2} = 1.5$, which is the opsonic index of the injected person. In other words, the phagocytic power of the injected individual is ,5 above normal.

Fig. 7. In this case there was severe pain in the lower teeth. This was due to an active streptococcic infection. After scaling the teeth he was given one-half c.c. of the pyorrhea vaccine. This dose was repeated five days later. In all he received seven injections, the last two being one c.c. each. The pus ceased after the third injection. The soreness left three days after the first injection. An examination a year after showed no signs of return and he has tight teeth today.

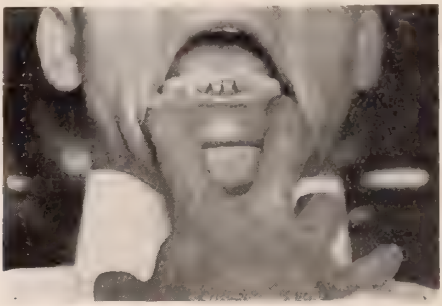

Fig. 7

Supposing, however, the serum of an uninjected individual suffering from pyorrhea be compared with the control film and we count 200 for the normal and only 100 for the abnormal—100-200 times 1=0.5. The phagocytic power of this individual is .5 or one-half what it should be, and under such conditions recovery from pyorrhea is improbable. Six injections of vaccine changed the index to 1.4, the discharge of pus stopping, all soreness being removed. There is a new tissue growth taking place and the teeth are tighter than they have been for some time. He is still under treatment (Fig. 8).

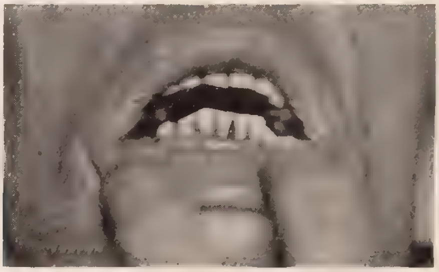

Fig. 8

Since this paper was read, this case has completely recovered and has tight teeth today.

DOSAGE

Success or failure in vaccine therapy depends more on the dosage than any other one thing, nor is there any set rule in regard to the dosage that could be followed. In this regard every patient is a law unto himself. The time allowed to lapse between doses is also an important thing to be considered in their use. The first effect of an administration of a dose of vaccine is generally to depress the index, and if the dose be large a marked and long depression of the opsonic index may result.

In this case (Fig. 9) the first effect of the vaccine was to depress the index from 1.1 to 0.7, the depression lasting for two days. Sometimes before there is a depression there is a rise in the index. Were another injection given during this false rise a summation of negative phases would be the result. This is something that should be carefully guarded against. This is followed by a rise in the index to 1.5, after which the index falls again, and on the seventh day after inoculation the index is 1.2, returning to normal three weeks later. From this record it will be seen that this individual should receive an injection every four days, increasing the dose to 1-10 c.c. at each injection. In this case five injections were required to overcome a streptococcus infection. (Fig. 10.) This picture was taken eight months after treatment was stopped. The teeth are tight, but the lack of care they are receiving, as shown by the picture, will result in a return of pyorrhea as soon as the resistance is lowered again.

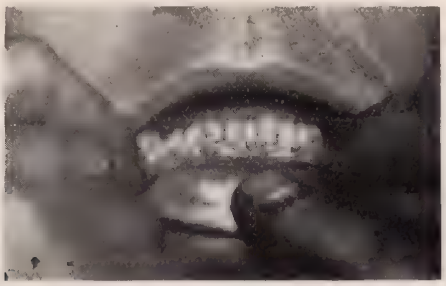

Fig. 9

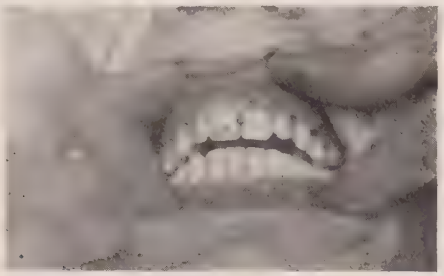

Fig. 10

The most serious of conditions coming under this classification are those where the infection is the pure streptococcus. This organism generally does not produce pus. In other words, presence or non-presence of pus is no diagnostic indication that the case is or is not infective. Further, if presence or absence of pus were to be taken as a diagnostic indication that it is or is not pyorrhea, the most serious cases and those capable of making the most rapid gains, doing the greatest damage to the alveolus and health of the patient, are being completely overlooked.

If the presence or non-presence of pus is to be taken as a diagnostic indication as to whether bacterial vaccines are indicated or not, vaccines are not being used in the cases where they are needed most.

This is not theory but it is based on definite findings in a large number of just such cases with unusually good results with vaccine therapy. In my experiments, a dog developing pyorrhea either naturally or artificially produced, usually dies within a month. A general infection follows rapidly unless checked by previous treatments of vaccines.

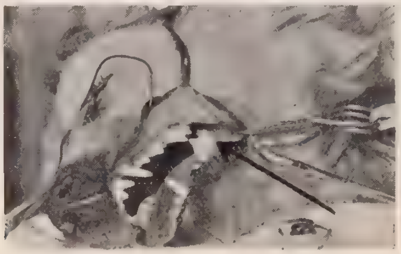

Fig. 12

Fig. 12. This dog was infected with 100,000,000 staphylococcus aureous with no result. 20,000,000 pneumococcus was then planted between the alveolus and the root. No result. Staphylococcus albus was tried with no result; finally streptococcus (10,000,000 attenuated) was used, which rapidly produced pyorrhea and as rapidly passing on into a general infection causing a discharge from the nose, resulting in the death of the dog seventeen days after inoculation. Upon examination cultures of the streptococcus were obtained from the liver, kidneys and heart blood

Fig. 13

Fig. 13. Streptococcus was planted in the molar tooth, which was previously devitalized. What happened? A marked inflammatory condition developed all along the gum margins, followed by a slight recession of the gums. This was rapidly followed by a general infection resulting in the death of the dog twenty-two days after the streptococcus was planted in the root. The streptococcus was then recovered from the liver, heart blood, kidneys and spleen.

These two cases do not clearly show pyorrhea owing to the very rapid development of a general infection

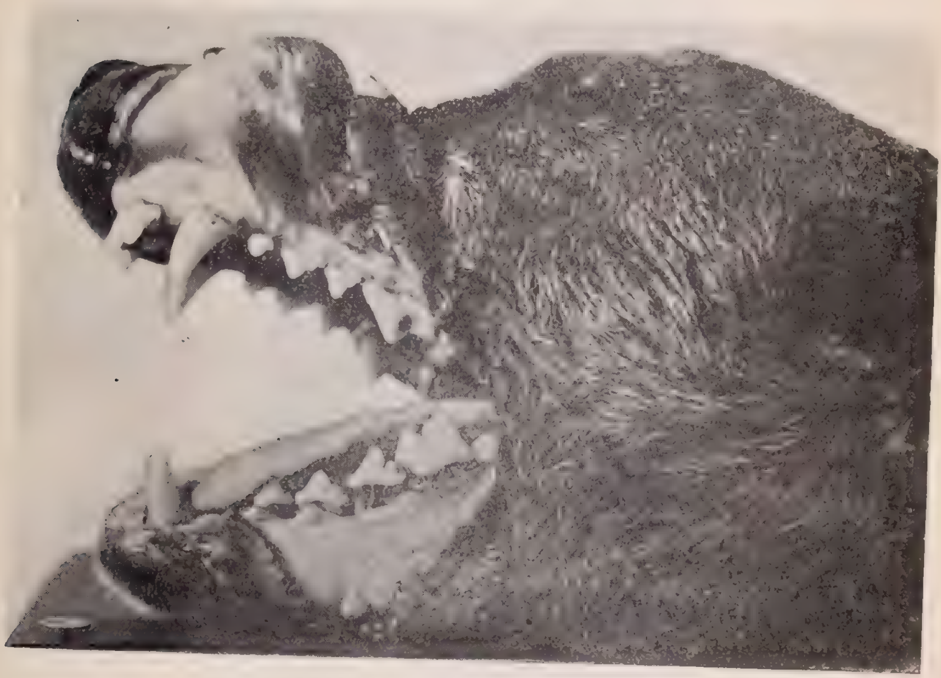

Fig. 14

Fig. 14. This is generally the rule. However, this shows a case where the dog was able to resist a general infection, resulting in a marked case of pyorrhea.

I do not have the time to take up the work with the various organisms found in pyorrhea, but will say that the work done points strongly to the streptococcus. We have been unable to produce pyorrhea in animals with any other organism or combination of organisms. The staphylococcus likely plays an important secondary role as it liberates toxins keeping the upper portions of the infected area inflamed and on the defensive. The pneumococcus plays a very minor role if, indeed, it is involved at all. We do not believe it to be involved but have not succeeded as yet in positively proving it.

In regard to the relative merits of the stock and autogenous vaccines, I would say that I must give the preference to the autogenous, but I do not use them exclusively due to the time required in making them. In all cases where a stock vaccine fails to give a response after the third or fourth injection an autogenous vaccine should be resorted to.

During the last three years I have been working on stock vaccines in an effort to produce one that would produce equally good results as an autogenous in the majority of cases. As a result of this work a combination of streptococcus 40,000,000, staphylococcus 200,000,000 and pneumococcus 40,000,000 has been evolved. This combination has given results equal to those obtained by the use of autogenous vaccines in all the cases it has been used so far as I have been able to find out. This vaccine is composed of various strains of the streptococcus, staphylococcus and pneumococcus in the following proportion: Streptococcus 40,000,000, staphylococcus albus 200,000,000 and pneumococcus 40,000,000. It is marketed by Parke, Davis & Co. in the syringe, four bulbs containing one c.c. each, and in bulk form containing five c. c. and 20 c. c. The contents of the bulb may be withdrawn in two ways—by removing the cork or by first dipping the rubber cork in phenol, then alcohol, and forcing the needle through the cork. The handiest way to use the vaccine is the syringe package. This needle comes wrapped in a sterile container and is sterilized.

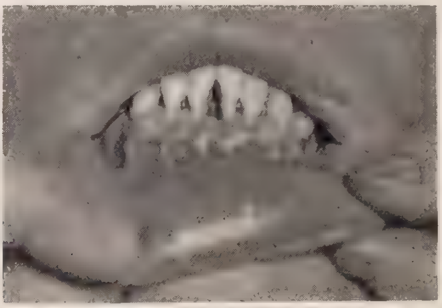

Fig. 15

Fig. 15. This gentleman had undergone local treatment for pyorrhea for about one year. At the end of that time he was not able to eat a meal without severe pain. His opsonic index was low to streptococcus. Pus was present. Cultures showed streptococcus predominating, staphylococcus albus producing the pus, three injections of vaccine given five days apart stopped the pus.

The opsonic index still remained below normal to streptococcus .85, but above normal to staphylococcus 1.1. An increased dose given three times five days apart resulted in a rapid rise in the index to 1.5 for streptococcus and 1.7 to staphylococcus albus. All soreness left the teeth when this point was reached and the gums took on a healthy appearance. Granulations followed this. The teeth are becoming firmer. Vaccines are still being used, small doses given every two weeks to maintain a high index, this preventing a recurrent infection.

Fig. 16. In this case the opsonic findings were .7 to streptococcus, .9 to albus. Injections given in this case were .5 c.c. stock vaccine every six days. Four injections raised the index to 1.7 to streptococcus and 1.8 to albus. This is an exceptionally high index which was maintained by giving only 1-10 c.c. every three weeks. All discomforts disappeared as the index went above normal. The teeth are becoming tighter and a complete recovery is expected.

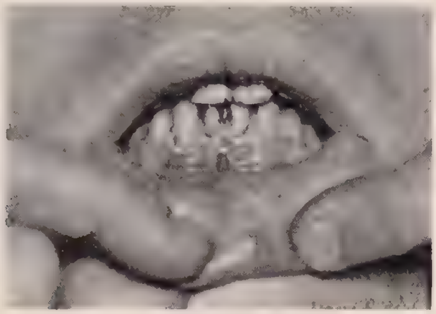

Fig. 16

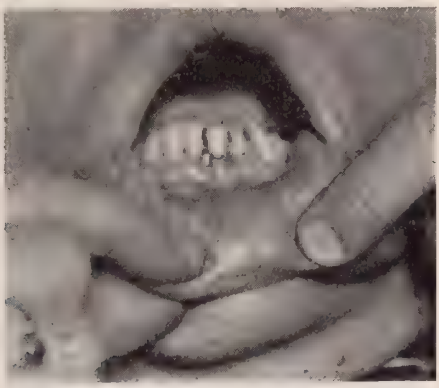

Fig. 17

Fig. 17. Complete recovery followed vaccine treatment in this case. Two injections of pyorrhea vaccine caused a secession of all pus. Before injection the index was .5 to streptococcus normal to albus. After two injections the index was 1.4 to streptococcus, 1.7 to albus. The pulps in the lower molar teeth were killed by the infection. These teeth were not loose enough to destroy pulp. A streptococcus infection was found in the pulp. The whole upper and lower jaw was involved, bicuspids and molars on the upper left being loose. Also the lower central and lateral incisors.

This gentleman does not have a loose tooth in his head today and is enjoying three good meals a day.

Fig. 18. In this case there was a very active streptococcus infection. He was not able to bring his teeth together due to the severe pain. Instrumentation was impossible, due to the intense pain. His mouth was completely filled with pus. Two injections of stock vaccine reduced the amount of pus to such an extent that he was able to close the jaws without pain and instrumentation could be resorted to. Four more injections of vaccine caused a secession of pus. The teeth are now tight and normal condition has been brought about.

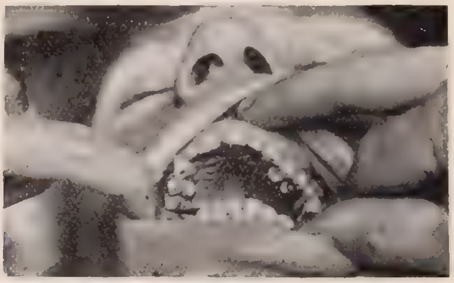

Fig. 18

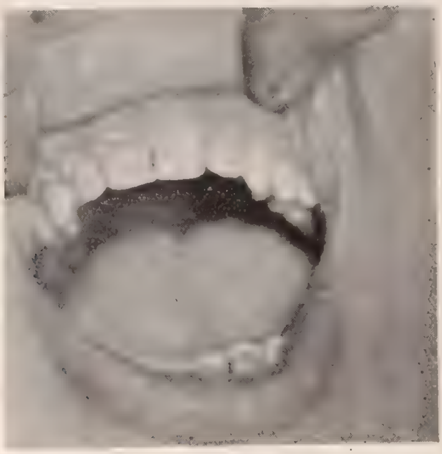

Fig. 19

Fig. 19. Here is a milder form of a streptococcus. The pockets around the centrals were very deep, reaching to the apex of the root in the left central. This tooth was quite loose. Recession of the gums had just started around this tooth. The other central was tight and not affected much. The pyorrhea seemed to be confined to these two teeth. Five injections of the stock vaccine made it impossible to obtain a culture of streptococcus. This pocket filled in completely in five months' time.

Fig. 20. This gentleman suffered with neuralgia for a year, during which time he was treated by his physician. He was referred to me and a

careful examination revealed a streptococcic infection in the centrals and laterals and cuspids. There was no pus present. The teeth were carefully cleaned, all deposits removed. He was kept under local treatment for one month, during which time there was no change in his condition.

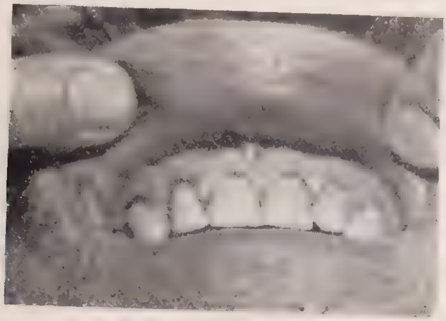

Fig. 20

Vaccines were then used, he receiving eight doses of the stock vaccine. After the third dose all pain disappeared. A culture was taken at this time and a very small amount of streptococcus was found in one pocket. An examination eight months after showed complete recovery.

THE ANTRUM OF HIGHMORE*

BY DR. T. F. DRISKILL, PALACIOS, TEXAS

AS I AM SOLICITED by THE SUMMARY and other friends, I will give some of my methods of treating the diseases common to the antrum. For more than twenty-five years I have given the subject a great deal of time and study. I have kept track of what our leading journals have brought to my office; besides, I have carefully read what the authors have written on the diseases and treatment of the same. I am sure the reader will find that my methods are not peculiar to myself, yet I may be able to emphasize some things that may lead others to an investigation that will be of inestimable help to suffering humanity, and bring rewards to the operator that can hardly be obtained in any other kind of oral surgery. It is here that the patient is willing to pay a fee; and he should be given to understand that such operations in other fields of surgery, of no less importance, bring fees commensurate with their importance. From observation and reading, I am of the opinion that I have treated more antral cases than many do who live in the larger cities. When quite a young man I was thrown from my buggy by a fractious horse. The malar bone on the left side was fractured and it produced a severe antral disturbance. Physician after physician failed to do me any good, because my trouble was not diagnosed. During a year or more of my suffering several patients with empyema were treated by myself. Then I determined to visit the late Dr. A. P. Boston, a specialist and a friend of my early life, then practicing his specialty in New Orleans. The middle turbinated bone was removed which gave sufficient drainage and access for treatment, which brought relief.

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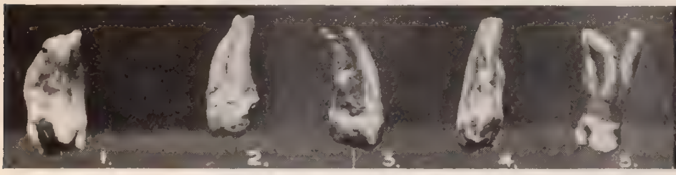
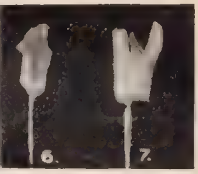
* Written especially for THE DENTAL SUMMARY, upon solicitation of the Editor. Dr. Driskill is doing a very remarkable work, and his modest description of cases is recommended for careful reading and study.



Card No. 1



Card No. 2

I returned to my practice in Corsicana, Texas, where I practiced for twenty-three years or more—determined to leave no stone unturned that might aid me in diagnosing and treating a disease that is fraught with such dire consequences. When you take into consideration the great quantities of secretion that are daily poured down the throat from a diseased antrum, you need not wonder that every town, city and hamlet has its quota of so-called incurable cases of catarrh, which, in turn, brings laryngitis, bronchial troubles, nephritis and ever so many auto-intoxicated conditions.

Out of the many, many cases that I have treated I will mention only a few that you may catch a glimpse of what I believe should be done in a large percentage, if not in every dental office.

No. 1. Mrs. T., called with her husband to have her teeth put in order. I found her suffering with paralysis of the right side of the facial muscles of the eye. I diagnosed her trouble as antral. Quite a little argument was used to convince her that an operation was necessary, as she had been unsuccessfully treated by a "good physician." Finally she consented. The first molar being nearly broken down, it was removed and it was found that an entrance fully one-half inch wide and the width of the roots from bicuspid to second molar had been made by the destruction of the bony socket. The cavity was full of adenoid tissue, which was easily removed—cavity flushed with antiseptics and properly cared for. The paralysis subsided in ten days. The lady was about twenty-seven or twenty-eight years of age. Her physician was advised to continue a systemic treatment as soon as the operation was performed, which he did.

No. 2. Mrs. L., about 40, the wife of a physician, very anemic; loss of weight, bronchial cough, and she was thought to have tuberculosis in its last stages. Through a friend, she was induced to call at my office for an examination. I noted on the right upper side several dead teeth and one on the left. She was expectorating a yellowish secretion, tinged with green. I diagnosed her case as double astral empyema. The only question, was vitality sufficient for an operation? The hope of raising two beautiful little girls, ranging from 12 to 14 gave her courage. An appointment was made. The first and second bicuspids were first extracted under a local anesthetic, which I have always had my druggist prepare for me for extracting and for all such operations. The second bicuspid entered the antrum. With a suitable elevator I probed in between buccal and lingual roots, then with a slight effort I pushed it down and out of its socket, bringing a lot of necrosed process with it. I am sending within this paper a photo of that tooth and four others, on card No. 1. Tooth No. 1 is from Mrs. L.'s mouth. You will note that exostosis has united two of the fangs, leaving a distinct loop in the center. This, as well as the second and third molars, penetrated the antrum also and exostosis marked all of them.

The remaining floor of the antrum was removed and the cavity thoroughly flushed with a weak peroxide solution, and then with an alkaline wash. I should mention that the cavity was filled with a green fluid which was very stubborn in changing to a benign color; the left side not being so bad, only one molar was removed. The cavity being filled with a yellowish fluid, it was in like manner as the first flushed and dressed. The cavities were packed with a five per cent. iodoform gauze, which was removed and retreated on the second day. Sometimes the cavities were irrigated with a one- to one-thousandth bichlorid solution, followed by a saline or an alkaline wash. Occasionally a two- to four-per cent. zinc chlorid solution was used. Progress was slow, but the patient began to gain strength within a week and within twenty-five days the secretion showed marked improvement. After the first twenty-five days the left side was practically well, but the right side was dressed and redressed for nearly three months. By that time the consumption-like cough had left the patient and she was dismissed. It is not out of place to mention that I advised that the patient be put on an iodid elixir, which she took three times a day for about two months and then she was put on a syrup of hypophosphites with lime and soda. Within six months the patient gained forty pounds.

No. 3. Dr. B., the eye, ear, nose and throat specialist whom I visited in New Orleans, afterwards moved to Dallas, Texas. Suspecting that the right antrum was affected with empyema, he visited my office for an operation. I readily agreed with him and arranged for the operation on the following day. He wore a full upper denture. About where the first molar should have been, after anesthetizing the part, with suitable surgeon burs an opening sufficiently large for drainage and treatment was made. The cavity was filled with a yellow pus. After curetting and flushing with an alkaline solution, the plate was replaced in the mouth with directions to wear it all the time. Every day for two weeks the cavity was flushed with normal salt water and frequently with a five per cent. solution of tinct. of iodin. After the first two weeks the patient came for treatment from once to twice a week. Then not so often. After the fourth week the cavity closed nicely. The doctor was anemic and suffered from neurasthenia. He was advised to re-enforce the local treatment by some constitutional treatment from a physician, which he did. The neurasthenia complained of soon subsided.

No. 4. Mrs. M., about 43, came to have a dead second upper left bicuspid, with a gold crown on it, treated or extracted. A cough, purulent secretion passing down the throat and the eye so bad on that side that she darkened it when reading or sewing. The tooth was extracted, and necrosis led into the antrum. With suitable surgeon burs a sufficient amount of the buccal wall was removed to curette the antrum, which was filled with soft, polypi-like growths. The usual dressing was kept up for two months. The patient used an iodide treatment for thirty or forty days. She made nice recovery and the eye became normal.

No. 5. Mrs. H., age about 30, the wife of a leading physician, called to have tooth treated on account of severe pain in right check and eye. She was a sufferer from Rigg's disease from girlhood, so she said. An examination indicated empyema of the right antrum of Highmore. I telephoned for her husband who was anxious for an immediate operation, the patient was also willing. Seeing that pyorrhea had hopelessly loosened the teeth, extraction of all the molars on that side was decided upon. After extracting the teeth, a probe could be easily passed into the antrum through several perforations that evidently were the result of pyorrhea. Adenoid tissues could be detected. The floor from the first to the third molar inclusive was removed with suitable burs, and the cavity curetted for all diseased tissue that could be detected. The cavity was dressed as usual, only I used dilute iodin more liberally than usual. I asked the doctor to prescribe what he thought best, but he desired that I suggest my usual "stand bys." I then advised an iodin elixir for thirty or sixty days with discretion, with some good restorative tonic, which was given. Because of extreme weakness of the patient I visited her home for the first week, irrigating the cavity with a solution of glycothymoline every morning and repacking with the gauze. After one week the patient gained in strength rapidly and she was able to come to the office at regular intervals of several days apart. I often used a weak solution of chlorid of zinc, and once or twice a one- to one-thousandth solution of bichlorid of mercury. In about two months the patient was well, and soon after all her teeth were removed and artificial dentures made. This patient also showed signs of extreme bronchial affection, which gave way on being cured of empyema of the antrum and her health became better than it had been for several years before.

No. 6. Mrs. W., had been a sufferer for several years with extreme pain in left side of head and face. Her physician referred her to my office for an examination of her teeth. The teeth were loose on that side from pyorrhea. The secretion passing from the post nasal section indicated antral disturbance, also polypi arising from the antral wall far back in the nasal passage. The teeth being hopelessly diseased they were removed and a sufficient amount of the floor was removed for thorough curetting. The antrum was full of tissue, like the polypi showing in the nasal cavity. The cavity was dressed as usual, and in a few days after the operation her physician removed the polypi. This patient made such apparent recovery that she was dismissed within thirty days, but to our surprise she returned in ten days with the cavity full of green pus. I then removed all the floor of the cavity, searched for adenoid tissue but found none. Then I suspected necrosis on the floor, due to Rigg's disease. I was careful to see that no root socket was left without being cut out. I swabbed the cavity with tincture of iodin, holding a sufficient cotton in the posterior to prevent the excess from running into the throat. I again packed as usual and requested her physician to put her on the best tonic possible and to reinforce with a little of the iodides. Her system was so thoroughly poisoned that she was quite weak and as usual I advised a good diet of malted milk for several days at least. With the aid of the physician and regular treatment the patient soon rallied, but I kept her under regular treatment for two months longer. The opening was ready to close, but I kept her under observation for two months more. The restoration of general health was remarkable.

No. 7. A man of about 25 years of age came to have a tooth extracted. He requested chloroform. A physician was called. An examination revealed organic heart trouble and chronic nephritis was also indicated. Antral disturbance was indicated, but being a man of no abiding place, treatment was not desired. The tooth was extracted without any anesthetic whatever, and apparently without pain. It is shown in the picture over No. 5. You will note that exostosis was well developed.

No. 8. Mr. M., about 50 years, a wholesale grain merchant, called to see if his teeth had anything to do with pain in his head, neck and shoulders. General health was bad, coughed a great deal from bronchitis. The secretion indicated empyema of the antrum of Highmore on the right side. A "bad molar" or two were extracted. Entrance into the cavity with heavy surgeon burs was made. It was full of yellow pus. The nasal passage was almost closed from hypertrophy. The usual treatment was given and as I do in all such cases, I advised him to wash his nasal passages night and morning with a warm normal salt solution, alternating with thymoline: This the patient can do at home, which brings much comfort. and relief. When cured the nasal hypertrophy passed away.

The foregoing are a few sample cases treated while I lived in Corsicana. Owing to failing health I moved to this coast town four and a half years ago, where I opened an office after a short rest and recuperation. Soon after opening my office:

No. 9. Mrs. K., of Missouri, called for advice and treatment. Some six or seven months before she had visited a dentist who extracted the second upper left molar. She said it "left a hole in her jaw as large as the tooth." She returned to her home and because of a bad taste in her mouth she visited her dentist again, who "washed the opening out and said it would soon be well." Time rolled on and her health began to fail, and while visiting this section she was induced by a dentist, who was also visiting Texas, to see me. I discovered that a good portion of the adjacent floor of the antrum was in a necrotic condition, the cavity full of adenoid tissue. After curetting the spongy bone and the cavity, I dressed it as usual and put the patient on the Elix. of Soda Bromid of Cal.-Com. for thirty days. Being a Christian Scientist, she did not like medicine, but after humoring her prejudices a little she consented to follow my advice. At the end of thirty days but little progress had been made. I then filled the cavity with a bismuth paste, which I left in for ten days, when I discovered it was being forced out by a green-like pus. I removed the paste, thoroughly washed with a solution of dioxygen, then with a solution of tincture of iodin I repacked with the iodoform gauze, which remained for one week. At this time I advised the patient to get a bottle of maltine, with hypophosphites of lime and soda, and to take it three times a day. When she returned at the end of a week, I found her cheerful and hopeful. The secretion was improving rapidly. This treatment I kept up for quite a month, sometimes using glycothymoline liberally as a wash. Finding the orifice inclined to close up, I again filled with bismuth paste and it was but a short time when I found the opening closed and the patient well.

No. 10. Dr. T., a college professor and a Baptist minister, who came south from Canada because of asthma, and bad health. Had recently been treated for neurasthenia by an osteopath but results had not been obtained. He called to have a tooth treated when I found the upper molars on both sides extremely loose from pyorrhea. From the distressing cough I suspected empyema of both antrums and so expressed myself. "Well," said he, "I have tried nearly everything else, and I have but one time in which to die, so you may do what you think best." I removed the molars and found that the germs had eaten well into the cavities from the buccal roots. The floors were removed and on curetting I found them filled with adenoid tissue. Owing to his extreme anemia I advised him to call a physician, who rendered valuable service. He would often have fainting spells when treating him, and yet he stood the first operation without any special weakening. The physician put him on a good stimulating tonic for one or two months. The accumulation of yellow pus made it necessary to dress the cavities every one and two days for two weeks. In this case I frequently used bichloride of mercury, chloride of zinc and iodin. (In the use of the first two let the operator be extremely careful, but I think they have their place in this troublesome disease.) Within thirty days the patient was making rapid progress. The cough was relieved, the neurasthenia was gone, the patient was eating plenty and resting well. After the first month the cavities were packed every five or six days and washed with a saline or an alkaline solution. At the end of sixty days the cavities were ready for closing, but the patient was not dismissed under three months. His physical strength was practically restored.

No. 11. Mr. D., age 55, from Kansas, came south seeking relief from bronchitis and other complications. Said he had been under constant treatment by physicians for several years. A physician whom I had previously treated for empyema, brought him to my office for my opinion. I diagnosed his trouble as having originated in Highmore. Chronic nephritis had brought him to the verge of despair and the good physician thought him possibly too far advanced for any hope of relief. When I asked him to open his mouth he explained that he would "gag and throw up" if I touched any part of his mouth. I found it so distressingly true that when we arranged for the operation I had to saturate a swab with the anesthetic and thrust it back on the soft palate for a time or two. Having given him a sufficient stimulant I anesthetized the parts well, extracted a decayed second molar on either side, the first having been previously lost. The openings were made free, so that curetting should be easy. Each cavity was filled with a polypi-like tissue and each nostril was sur-charged with the same growths. With the physician's help all growths were removed. The cavities were treated as usual. The patient had extreme vomiting spells every few days for months previous to the operation. At the time of the operation the prognosis of the physician was that it was doubtful if Mr. D. could live two months longer. He had made every arrangement for an early demise and had it not been for the prayers of a faithful wife he would hardly have entered into the operation. The operation and treatments put an end to the vomiting spells, but the improvement was slow. He was put on Hexamethyline, some of the idodided and other constitutional aids. The Hexamethyline was kept up from time to time for four months. At the end of three months I thought nature was assisting itself for an early healing. I loaded the cavities with the bismuth paste, but in eight or ten days the odor from the antrums was terrific, and a yellow and greenish pus passing through the nasal passages. Each antrum opening was dilated and the parts with considerable broken-down tissue were curetted out and the cavities well flushed with cleansing fluids. With suitable swabs the cavities were "mopped" with tincture of iodin and redressed with the gauze. From that time on for two months the usual treatments were given when the patient had made such recovery that he was dismissed. His blood pressure had made satisfactory improvement and his general health was so much better that he returned to his home a much happier man, and yet nephritis had made such inroads upon his constitution that he will never be strong again, but to make his life tolerable is "worth the while."

No. 12. Dr. E., a physician friend officing on same floor with myself, a comparatively young man, stepped in one day and asked me to examine a dead bicuspid on the upper right. He was anemic, a constant dripping in the back of the throat was thought by himself to be chronic catarrh. I pointed out empyema signs, and took the case under supervision for two or three days, when I advised an operation. The doctor readily consented, and I believe he was a little surprised when we found it filled with yellowish pus with some adenoid tissue. He was a good patient, took my iodin advice, some Hexamethyline, and other tonics. He had come to the point where "life was a burden," did not care whether he got a call or not, and wondered why he cound not walk as fast as other men. In seven or eight weeks the doctor was practically well. He is no longer troubled with a constant discharge and scabs in the nasal passage, and his weight soon became normal and he wanted all the practice he could get.

No. 13. Mr. F., a young man with a wife and three children, from New Mexico, landed in Palacios and was thought to be in the last stages of consumption. All his means had been exhausted in search of health. His faithful wife came, through the influence of a friend, to see me; I explained that I could not render an opinion without seeing her husband. After long persuasion he called to have me make an examination. His mind was so weak from the disease that he could not take any interest in what I really wanted to know, and I confess that aside from a microscopical examination, I should have suspicioned tuberculosis if I had not seen the inroads of empyema of the right antrum. On card two, tooth No. 6, you will notice necrossed second bicuspid, which was surrounded by dead bone. When it was extracted the pus from the cavity had such a fearful odor that it not only made him "deathly sick," but the operator had to use a deodorant immediately. After removing the first bicuspid, which was in a similar condition, a free opening was made from that point of the floor and up on the side for curetting. The usual washing and flushing with weak iodin was kept up daily for two weeks, as well as the gauze packing. After that I saw the patient twice a week for two months, when I considered the antrum ready to close. As he had come to the point where nourishment was important, I put the patient on malted milk and whatever he could be induced to eat, except cow's milk, which I never advise a patient to use who has antrum trouble. In two weeks' time the patient was eating plenty and his rest was normal, and he was dismissed within two and one-half months. He is now able to do any kind of labor and he is a normal man again.

No. 14. Mrs. S., about 40, from Illinois. Her husband had visited specialists in New York, Philadelphia and Chicago for a serious defect in the right eye and other complications. She was advised that the eye could not be cured. On account of her nervous condition she and her husband visited South Texas, hoping to receive some benefit. A coincident worth mentioning occurred in the office of my friend, Doctor

Elliot, whom I spoke of treating under No. 11. Dr. E. Boston, a specialist of San Marcus, Texas, was on a recuperating visit to this place at the time, and he is the son of the specialist named under No. 3, whom I treated. When Mrs. S. called at the doctor's office for some advice, the two M.D's were together. After some preliminary examination the two doctors accompanied the lady and her husband into my office. After an examination it was easy to detect the yellow secretion flowing from the region on that side. An operation was arranged for the next day, when both physicians could be present. On card one, pictures of teeth 2 and 3 represent the second and third molars, which were dead, and penetrated the antrum, the first had been lost for a number of years. No. 2 is a fraction above one inch in length. No. 4 was a dead lower third molar with a chronic abscess. You will note that it also bears the marks of exostosis. The sockets above were well opened and treated as usual. This patient was put on the iodides as well as other aids. She required medical attention for a week or more, because of a general nervous breakdown. In two weeks' time I became suspicious of the cuspid and two bicuspids, and therefore extracted them. I found the bicuspids badly decayed and pointing into the antrum. The apical portion of the cuspid had absorbed by one-fourth the length of the root. I'm sorry that I failed to keep those specimens. At the end of the third month the lady was dismissed with her eye on the road to recovery and her general health wonderfully improved.

No.15. Mr. C., age about 50 (our postmaster) called to consult me about a second molar on either side above, was suffering a great deal from throat trouble, bronchitis and kidney complications. From the yellow and greenish-tinged flow I pronounced empyema of both antrums. Being under medical care he decided to try out a system of treatments which he continued for seven months longer, when his physician decided that throat swabbing, nasal treatment and medicine would not do the work. Therefore, six weeks ago he submitted to treatment, but by that time he was a much frailer man than when I first diagnosed his case. Those elongated molars were removed and the floor was found to be perforated. One was filled with yellow pus, the fluid of the other was tinged with green. After curetting, the cavities were thoroughly flushed with a dioxygen solution, followed with an iodin solution, and the usual packing. The patient was so anemic and run down that he required the aid of the physician for two weeks, the greater portion of which time I went to his home every two or three days and gave him the treatments necessary. After two weeks the patient gained so rapidly that he was able to resume his duties in the office. His cough and sore throat passed away like magic. He was put on the iodide elixir for thirty days and now, after six weeks, he is still on Hexamethyline, tonically. Ten days ago the cavities were filled with the bismuth paste. The patient "looks and feels like a new man." I will likely keep him under observation a month longer; yet he is apparently well.

No. 16. Mr. C., age 26, from Iowa. For several years has suffered from hay fever, bronchitis and other complications. Came to Palacios in the early fall to spend the winter here, hoping the climate might do him good. His troubles required medical attention and after recuperating from several weeks' illness, his physician brought him to my office for an opinion. I readily discovered the left antrum involved. The first molar had formerly carried a crown, but was now only fangs. The second molar had a peculiar light color and was slightly elongated, as the inferior molars were only roots. We decided to extract all these. I was confident pus was flowing from the upper tooth, but I could not find any opening. On extracting the molar the palatine root was found to be two-thirds absorbed and the crown was only a shell, and yet there was no cavity in the crown or enamel walls. This absorption suggested to my mind that, in all probability, the patient had at some time been subject to phosphorus poisoning to a slight degree, and when I suggested the possibility to the attending physician, the patient remarked that his wife had on several occasions reprimanded him for using matches for toothpicks. The cavity had quite a lot of adenoid tissue in it which penetrated into the nasal passage. The physician had partially removed the polypi which possibly led him to suspect the antrum was involved. This patient now, at the end of one month, is making slow progress, but with four years of bad health on his shoulders we cannot expect him to improve by leaps and bounds; yet he is evidently gaining on the iodide and hexamethy—together with the usual care of the antrum. This tooth is in the hands of a friend in Philadelphia—wish I had secured a photo before parting with it.

No. 17. Mr. L., age about 33, from Indiana. Came south on account of bronchitis and a conviction that he had tuberculosis. Had been treated in Chicago and other places for catarrh and general debility. For a while he thought the climate would cure him, but when the fall rains set in he went down rapidly. A friend induced him some three months ago to see me. I found him suffering from pyorrhea in an aggravated form, and the left antrum involved. He wrote back to his specialist and his physician who "hardly thought the diagnosis correct," so they stated in their replies; but after comparing his own case with several whom he conversed with who had been treated and cured, he decided to celebrate New Year's by requesting the operation for 2:00 P.M., January 1st. The first molar was extracted and it is represented on card two and tooth 7. You will note a sack between the anterior fang, which fang is partly absorbed, and the palatine fang. The adenoid-like tissue penetrated the antrum. It was much longer on extraction but shrunk up considerably after laying in alcohol for two weeks before the photo was taken. The second bicuspid appearing to be involved, it was also extracted, which gave room for curetting after removing the floor and a slight portion of the wall in a crescent-like shape. The cavity was full of a polypi-like growth, which also filled the back portion of the nasal cavity and with a little help from the attending physicians, these growths were removed and the cavity dressed as usual, the patient also put on the usual constitutional remedies under the supervision of his physician. At this writing he is making nice progress and his chances are good for a restoration to health, but the patient will likely be under treatment for several weeks yet.

I would like to tell you of a recent patient, Mrs. B., 65 years of age, who wore full dentures. Suffered a great deal with the left side of her head and the base of the brain. She called to have her plate examined because she thought it had "worn through to the bone." An undeveloped wisdom tooth was in sight in a mass of necrosis—all of which was removed to find the antrum full of green fluid. In removing some necrosis on the lingual side the hemorrhage was more severe than I ever saw, but by a free use of an aqueous solution of iron and a "tight" packing with iodoform gauze the hemorrhage was soon checked. The usual treatment was followed for some seven weeks when the patient was dismissed in fine health.

Also a Spanish lady who was apparently losing her mind and the right eye. After two months' treatment she was restored to normal health.

A case of no mean importance is a little boy, 13 years old, who got a cotton seed in his right nostril while at play some four years ago. After repeated efforts by two different physicians they concluded the seed was "pushed back and swallowed." A catarrhal condition set up but no suspicion of the cause was attributed to the cotton seed. In less than a year auto-intoxication produced such an anemic condition that the child could not walk, and within two years he was placed in a sanitarium, where it was found pus had gathered within the diaphragm. An operation requiring the resection of the eighth rib was performed and the cavity drained. After being dismissed from the sanitarium and on returning home the little fellow was hauled about in a child's buggy for his outings, but gradually became able to walk. After three years the cotton seed was eliminated during a spell of pneumonia. The child recovered and was apparently doing very well, save for a foul secretion from that passage. Last fall he was placed in school, but his health declined so rapidly that his father thought some carious teeth might be the cause. He brought him for an examination, when I discovered the antral wall was perforated, and then his father gave me the history of the case. By means of a glass syphon I was able to flush and irrigate the cavity, and by suitable applications medicate the same as occasion demanded. After two or three weeks' treatment he remarked that he felt better than he remembered of ever having felt in his life before. His nervousness in school passed off and he was able to keep up his grade. I have had him under treatment now for a little more than two months, and the prognosis is good. I believe he will make complete recovery. Here is a case that diagnosis had evidently been overlooked.

The foregoing are a few of a long list that may be helpful to others.

In conclusion, let me say that the physician, the authors and the leading journals have been my best allies. After a physician or so have seen your work they become, as a rule, feeders and helpers.

I believe that I should also say that no pyorrhea case should be dismissed until the disease is cured, and there is nothing so important in deciding that matter as the microscope.

THE EDUCATION OF THE FUTURE DENTIST

BY EUGENE S. TALBOT, CHICAGO, ILL.

> *" 'Tis education forms the common mind;*
> *Just as the twig is bent the tree's inclined."—Pope.*

NEVER IN THE HISTORY OF DENTISTRY in America was the educational question so satisfactory as it is today. Two meetings of the Deans of The Dental Faculties' Association of American Universities have convened this year and agreed unanimously to advance to a four-year course. The National Association, The National Association of Dental Examiners, The National Association of Dental Faculties have each and all officially committed themselves by resolution to the same advanced standard. To further force this issue, the state of Pennsylvania has passed an amendment to its dental law requiring that candidates for license for the practice of dentistry in that state shall maintain a course of study consisting of four annual sessions each in separate academic years. This law will require all schools in the state of Pennsylvania to begin the course of study not later than 1917.

The University of Alberta, Canada, which credits the examination of candidates for license to practice in that province, has passed a resolution which requires: (*a*) That the preliminary requirements of the college are at least equivalent to those required for matriculation into the University of Alberta; (*b*) That the college form an integral part of some recognized university; (*c*) That after January 1, 1917, a four-years' course in dentistry is given by the college in question.

The state of Illinois, I am informed under authority of its law requiring a four-year course to begin in 1917. Similar laws will soon be passed in other states. Once the colleges have adopted, and some of the states require a four-year course, it will be impossible to return to the former methods of teaching and a four-year course is thereby assured by every dental school.

Today there is a distinct demarcation in the general character of the different dental schools, which has been brought about in the last few years, not by the dental schools themselves but by the general atmosphere of the university, modern methods of medical training and public demands. The spirit of university training and environment has developed rapidly and the inclination of the dental student today is toward a university training.

On the other hand, Dean Moorehead has stated many times in the past few years that "owing to recent discoveries in the relation to the etiology of disease, a new type of dentist is demanded by the public to cope with pathologic conditions arising from focal infection of the mouth and other diseases as well." The deans of other university schools have also expressed the same opinion. This new type of dentist must have a broad academic training as well as a better medical education. This can only be accomplished by the university spirit. The University of Alberta recognizes this when it states *(b)* "That the college form an integral part of some recognized university;" must be one of the requisites for its graduates to apply for license to practice in that part of Canada. It is now recognized that the student entering the dental department must bring with him broad ideas of mental training and also a knowledge of how to study. His reasoning powers must be developed which can only be accomplished by an academic training. The time has passed when a student may enter a dental school from the farm, shop or factory and expect to acquire his preliminary training in a professional department of a university. Since this method is still carried on in some of the schools, there must from this time on be a distinct line of demarcation between them known as "dental departments of universities and separate and distinct dental schools."

The dental school, owing to the advanced thought and requirements, must hereafter actually become a department of a university. There are certain commercial dental schools which claim to be departments of universities, but are only so in name. This deception cannot but produce an unfavorable impression upon its alumni. The dental student of the future will enter only such institutions in which he can absorb the university spirit and obtain the most for his time, effort and money expended.

There is another marked reason why the university dental schools will become the popular school of the future. Research work is now required of the stomatologists. Already a large sum of money has been subscribed by the dental profession for this purpose. A few of the university dental departments and the Forsythe Infirmary have established laboratories for the purpose of carrying on this work. The dental profession at the present time is not qualified to do this kind of work. They are not educated for this special work nor have they the proper environment or temperament to conduct it. This can only be accomplished by obtaining an academic, modern medical and dental training, which can be obtained only in a university.

The four-year course having been settled by all the dental schools in this country, it is now up to each organization to decide of what the four-year course shall consist and how it shall be taught. In regard to this matter there are many differences of opinion as to minor details, but nearly all are agreed on a general plan. The only way out of the dilemma seems to be to agree on general principles and allow certain leeway for details, each school working out its own plan, when time will decide the correct method.

Very fortunately this was accomplished at a meeting called at the request of President James, of the Illinois University, held in Chicago, June 25, 1915. At that time Doctor Koch moved that this body confirm the action heretofore taken by other associations that we require a four-year course; seconded by Dean Kennerly. Dean Moorehead amended the motion to read four years after high school. This was unanimously carried. It was also moved and seconded that this law should go into effect not later than 1917. This was unanimously passed. Schedules were then taken, presented by six or seven deans. When compared, very little difference was observed in the number of hours, or the character of the dental course. There was, however, quite a difference of opinion of what the academic studies should consist, their subjects and how they should be taught. This discussion held the meeting for the greater part of the day. At length President Vincent, of the University of Minnesota, proposed that three and one-half years be devoted to the technical and scientific education of the dentists, and one-half year be devoted to ancillary subjects, to be worked out by each college. Doctor Koch then offered the following resolutions:

"That it is the sense of this meeting that we approve the plan of a four-year course of not less than forty-two hundred hours devoted to such subjects as are deemed essential to the technical and scientific education of the dental practitioner, with the understanding that the ancillary subjects shall be elective and not consume more than 600 hours of the course." This motion was passed unanimously.

The action taken by the Dental Faculties' Association of American Universities, seems to be a happy solution of the entire subject for the present. No dental school can object to any suggestions offered by this association. Since all schools have agreed and must adopt a four-year course after a high school graduation, the resolution by Dean Moorehead must be acceptable to all. It is true that the standards of high school education vary in different states. These standards, however, cannot be controlled by the dental department of a university any more than they can be by other departments. The university itself can settle this matter for the dental department, as well as for other departments and thus relieve the deans from all responsibility.

The resolutions of Doctor Koch that not less than 4200 hours be devoted to the technical and scientific education of the dental practitioner and not to exceed 600 hours to academic subjects, allows each school and college broad range to suit its own inclinations of what and how the subjects may be taught. The wording of this resolution is such that it is possible for a dental school to continue right along in the same rut that it has followed for the past twenty-five years, or it can follow the medical course of one academic year, giving a full course in the fundamental branches of medicine with the medical students, getting credit for the same towards a medical degree and finish with the dental course. Between these two extremes a medium course may also be prepared. The school, however, that does not take the advanced step will not succeed in the long run.

Dean Owre, who has given over seven years to the study of the advanced curriculum for his university dental school, has presented a very acceptable four-year course. This schedule, while adapted to his own requirements, may require a slight modification to comply with other schools.

The general plan, however, has been adopted by most if not all of the university dental schools. One of the best features of this modern movement is that each dental college must now stand on its own merits. Heretofore the schools have combined to hold themselves together on a mechanical basis due in a measure to the ignorance of the teachers. Adopting a four-years' course will mean that the teachers must now exert themselves to higher ideals. Teachers must be obtained with broad academic training and a medical education to retain the respect of the new class of men who will enter our schools. It is not uncommon for young men who have attended one or two years, to inquire of me where they shall finish their dental course and graduate, preferring to attend schools in which the teaching faculties are composed of a higher standard of teachers.

The time has passed when a dean or school can dictate the curriculum or standard of other schools. The character of these schools will be known by their curriculum and product, just as a medical school is today. They will be classed A, B, C, D, and the type of school will appeal to the public and a prospective student.

The experience of the medical schools in the grading is bound to occur in the dental schools. The poorer schools were obliged to give up or unite with other stronger schools. The students soon learned which were the better equipped schools and sought those of the higher rank. Within ten years the medical schools in this country have been reduced in numbers from 165 to 105.

At the meeting of The American Medical Association, held in San Francisco, June 22, 1915, the House of Delegates rearranged the sections to make them more comprehensive, compact and in harmony with the modern ideas of practice. The new arrangement divides the sections into medical sciences, medicine, surgery and the specialties. The specialties of stomatology, gastro-enterology and proctology are now united into one section. The section of stomatology, which was a distinct specialty in medicine, is now a part of the whole. All lines have been obliterated and the medical profession recognizes no boundary line. What a wonderful evolution our specialty has undergone at the hands of the mother profession in the past thirty-six years. When the section was established in 1880, it was called "dentistry." Owing to the character of the work done in the section, it was found necessary to change the name to that of "Dental and Oral Surgery." As the scope of the work developed and broadened this name did not seem to fill the requirements, and again it was changed to that of "Stomatology."

In the past two or three years the medical profession have come to realize that the mouth is the most important part of the body so far as diseases are concerned. It is the organ in which the germs collect which causes most of the diseases of the body. What then would be more natural than to combine diseases of the mouth, the intestinal tract and rectum under one section? The question naturally asked is, are medical confreres progressing too fast for dentistry? My answer is, that the members of the Section of Stomatology of the American Medical Association recognized thirty-six years ago that the dentist should know as much about general medicine as other specialists. They are still of the same opinion. The dental teachers, however, have not recognized this fact, but have continued all these years to turn out of their schools a lot of mechanics. Now that the teachers have added another year to their curriculum, will they appreciate the fact that our specialty has outgrown their methods of teaching, and that a real live proposition now confronts them?

DENTAL SURGICAL PATHOLOGY*

BY CARL D. LUCAS, D.D.S., INDIANAPOLIS, IND.

THE ADAGE, "Money is the Root of All Evil," should be substituted by "Procrastination is the Root of All Evil," and unfortunately, this root is the axial root which impedes progress in the greater proportion of our lives.

The writer was invited to prepare a paper for the 1915 meeting of the Indiana State Dental Association in ample time to have had a thesis prepared by the date the first word was written, but old Father Procras has his clutches so firmly implanted in his character that two weeks is all the time available for the work.

However, the writer has been slowly raking together the leaves shed from the great tree from the root of Procrastination and possibly the present is the opportune time for the final arrangement of the subject matter.

Thirteen years ago this coming June there was launched upon the unsuspecting public a raw recruit in the ranks of the dental profession and three years thereafter this recruit was condemning the profession as a mere trade and the then so-called skilled dentist as an artisan, the recruit occupying the position of a pessimist, and therefore a traitor to the cause.

Today this same recruit has advanced to the position of a regular, and the yellow streak of pessimism has become transformed into an "Alice blue" halo of enthusiasm which we hope has forever eclipsed the albus rays into complete oblivion.

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*Read before the Indiana State Dental Association, 1915

The demands of today upon our great profession have become so preponderous, both from the medical profession and the laymen, that no earnest member of our ranks can afford to idle away a moment's time which should be spent in search of knowledge which will further illuminate the dental horizon and help to dispel the darkness from our field of endeavor.

We do not fully realize the opportunities which are ours to raise the standard of civilization by the contribution of our earnest efforts toward eradication of disease from oral foci of infection, and by the co-operation which we are receiving from our medical friends the world is certainly to be made better physically and therefore mentally and morally, which assets shall greatly enhance the love of living.

No human being can possibly stand for his full value in service to his community if a single focus of infection be allowed to persist and the toxins therefrom allowed to permeate his body until a fertile field becomes invaded by these mental and physical parasites.

The oral cavity is the gateway to the alimentary canal and a portal of entrance, in a measure, to the respiratory apparatus, therefore oral hygiene in its strictest sense is the watchword of success in all avenues of life.

Our responsibility to our patient has not been fulfilled until we have learned how to scientifically guard the threshold of general health and happiness.

The poet tells us that Love occupies the highest pinnacle of complete happiness, but how can the mind properly functionate to produce the wonderful emotions if the body functions are not in perfect equilibrium?

Our profession is rapidly approaching the high position which it should occupy in the minds of the laymen at large, and such work as that which is being done by our efficient corps of research dentists, championed by our National Association, shall more firmly establish our ranks in the minds of the practical thinkers of today and the future.

It has been conclusively proven that many pathological lesions, such as cardiac lesions, rheumatic conditions, pernicious anæmia, iritis, arthritis deformans, acne, gastritis, enteritis, cholitis, tonsilitis, diabetes, etc., owe their incipiency to oral foci of infection.

In any of the foregoing enumerated pathological conditions wherein the focus of infection has not been diagnosed by physical examination or by means of microscopal diagnosis by the internist, the oral cavity should be thoroughly examined by the dentist.

Pyorrhea alveolaris in any degree present should be considered an etiological factor in any case of autointoxication. Careful and thorough surgical prophylaxis must be performed and the mouth rendered as nearly aseptic as possible. If the teeth involved are beyond a favorable condition for successful treatment for the complete eradication of the disease, no time should be sacrificed in their extraction. The normal physical functions of the patient are at stake and the health of the individual is of far more importance than is the preservation of diseased teeth. If the teeth must be sacrificed they should be extracted at once and artificial substitutes furnished as soon as practical. Substitutes for the natural teeth, if scientifically constructed, are entirely satisfactory, but there has yet to be discovered an artificial substitute for health. Even the undertaker fails in the attempt.

If there are any devitalized teeth in the mouth the patient should be referred to the specialist in Roentgenology for his aid in diagnosis.

Ten films should be made, five of the upper teeth and five of the lower, if there are five or more probable sources of localized infection. These ten films should be paspartouted with the developed sides of the films facing the operator, the first film upon the upper right showing the apices of the first, second and third upper molars, the second film upon the right showing the apices of the upper left second and first bicuspid and cuspid. The third film showing the apices of the upper right and left central and lateral incisors. The fourth film showing the apices of the upper right cuspid, first and second bicuspids, and the fifth film upon the extreme left side of the plate showing the apices of the upper right first, second and third molars. The correspondingly located films below the upper set will show the apices of the lower teeth in the same relation.

This set of films should be carefully studied by the light of a shadow cabinet, with the developed sides always facing the operator, and all areas of inflammation, necrosis, dental caries, defective fillings, ill-fitting crowns or bridges, impacted or supernumerary teeth, faulty pulp canal fillings, pulp nodules, cementomata, calcific precipitation, necrotic root apices, fractured roots, and any other abnormal conditions should be carefully notated and also checked upon the plate with an artist's pencil.

An area of necrosis will be obvious by a dark shadow upon the film, because the bone has been disintegrated by the pus and the actinic X-rays pass through the rarefied area to the sensitized film, producing a chemical reaction. Any dense substance like a gutta-percha canal filling, artificial crown, or filling in a tooth, or broach in a pulp canal will obstruct the actinic rays, therefore no chemical action upon the film will occur and that area will show light.

If any worthless substitute for a pulp canal filling has been put into a pulp canal, it will obstruct only a part of the actinic rays and it will be evidenced by a very light shadow, and an area of necrosis, lined with a pyogenic membrane, will be found in ninety-five per cent. of the cases where such a worse than worthless substitute for a pulp canal filling has been used.

From a pathological standpoint the worst feature about a worthless pulp canal filling is that the tooth, in seventy-five per cent. of the cases, is perfectly comfortable to the patient. There is usually no soreness upon percussion and rarely an issue from the abscess, therefore the unsuspecting patient is continuously absorbing toxins produced by the invading organisms. The absorption of these bacterial toxins may be productive of a low grade of intermittent fever resulting from the perverted metabolism and necrosis in the affected tissue. When the toxic substances absorbed contain the products of bacteria life, marked alteration in the tissue elements elsewhere in the body may occur.

The nervous phenomena that may accompany the low grade of inflammation are probably due to the direct action of the toxin on the nerve substance, or to the influence of the poison upon the capillaries distributed in the nervous tissue, giving rise to inflammatory or degenerative processes in these structures.

The pus from a discharging abscess is swallowed by the patient and the antiseptic properties of the gastric juice of the stomach renders the organisms less virulent and they are eliminated, to a degree, in the feces, thereby eliminating the toxins which the germs would have otherwise produced had they been retained, as in a blind abscess, and allowed to flourish in a fertile, protected field.

Therefore, the so-called blind abscess is infinitely worse than a discharging abscess, because the patient is constantly septic.

The day has passed when patients are advised to pay no attention to an abscess so long as no discomfort is produced.

There must necessarily be a cause for the presence of pus and the scientific dentist and physician of today treats the cause and not the physical symptoms of disease. If the cause be successfully treated and eradicated, the normal tissue resistance will automatically be raised and the formed toxins be eliminated, in the functions of normal metabolism.

Vaccines and bacterines are virtually only tonics insofar that the tissue resistance is raised by raising the opsonic index of the patient's serum, then the invading bacteria are affected by certain substances, called alexines, and are thereby easily taken up and disposed of by the leucocytes—the process of phagocytosis.

The subject of autogenous and stock vaccines will no doubt bring up some discussion, but it must be passed on account of the time limit.

If the Roentgenogram reveals an area of necrosis at the apex of a tooth root, which indicates a devitalized, gangrenous pulp, or a faulty pulp canal filling with gangrenous pulpal apex *in situ*, the canal should be aseptically opened and treated, according to the accepted technic in such conditions.

If the area of necrosis be extensive, with the root apex protruding into the pyogenic membrane, in seventy-five per cent. of cases the cementum upon the apical fourth of the root is necrotic and pitted. In that case only surgical excision of the necrotic root apex will affect a cure.

The technic employed by the writer in the surgical treatment of these cases has some original features so far as our knowledge goes. The technic is as follows:

Thoroughly anesthetize the area to be operated with a two per cent. novocain, 1-1000 of 1% suprarenin hydrochlorid solution by submucous infiltration. The infiltration should be made mesially and distally to the field of infection, upon the labial and lingual sides of the alveolar process. Never inject into the pyogenic membrane. Within ten minutes the gum tissue will be thoroughly anesthetized. A crescent-shaped incision is made, starting one cm. to the distal and carrying the incision one cm. to the mesial of the necrotic area.

A periostome is used to elevate the periosteum and mucous membrane over the field of operation, and a broad tissue retractor used to hold the flap away from the bone.

This will expose the pyogenic membrane if the labial or buccal plate of the bone has been liquefied by the pathologic process. By a gentle manipulation the pyogenic membrane may be removed intact. This will expose the roughened, necrotic root end.

A large sterile round bur should be used to cut the necrotic root end down to the healthy bone, which surrounds the vital cementum. The margins of the root should be rounded off with sterile round burs and small, sterile, mounted, cylindrical stones.

The pyogenic membrane should be curetted out in every case and the necrotic bony margins curetted to smoothness.

Thoroughly irrigate the wound with normal saline solution at frequent intervals during the operation.

With a small round bur in the straight hand-piece, the pulp canal is enlarged and a self-retentive cavity prepared in the canal. This cavity in the root end is carefully filled with amalgam and burnished perfectly smooth.

Any possible excess of amalgam is carefully flushed out with normal saline solution.

With an abruptly curved suture needle, threaded with medium-sized (No.0) sterile catgut, start a running suture at the distal extremity of the wound and suture the flap to the remaining gum tissue which covers the process at the cervical portion of the root. All of the sutures should engage the periosteum. Let the suture run to within one-half cm. of the mesial end of the incision and tie. Pack one-half inch sterile gauze, saturated in tincture of benzoin compound, into the wound at mesial end allowing gauze to slightly protrude.

See the patient the following day, remove the gauze and irrigate wound with normal saline solution. Do not repack the wound, but it should be irrigated daily for ten days with normal saline.

The percentage of cures in all cases as operated by the writer is 99%.

This technic is especially applicable to the upper anterior ten teeth upon the roots of which porcelain or porcelain-faced crowns have previously been mounted.

In such cases, if the offending tooth were extracted, a thorough curettement of the socket and a complete removal of the pyogenic membrane should be accomplished.

The writer wishes to report the case histories of a few cases of oral foci of infection and the resultant sequellæ and the results of surgical interferences in treatment.

Case 1. Mr. L. G. D., age 45, weight 140 pounds. Clinical picture, anæmic, chronically constipated, running evening temperature, general malaise. The patient had been losing his teeth from a pyorrheal condition which had never been treated. All of his remaining teeth were affected, were very loose and considered beyond successful treatment.

All of the remaining teeth were extracted January 8, 1908. On account of insufficient funds he did not have temporary dentures constructed but waited until March 6, 1909, when full upper and lower dentures were inserted. During the time which elapsed between the date of the extraction of his teeth and the time the dentures were inserted, he gained 14 pounds in weight.

One year after his dentures were inserted he had gained 40 pounds, his anæmic condition had entirely disappeared, appetite good, bowel movements regular and normal, and he reports no feeling of fatigue which he previously had noticed. Temperature normal.

Case 2. Miss H., age 27, reported for diagnosis of condition of the mouth, which might be productive of a nervous condition, which produced an insomnia of three years standing. Her features were disfigured by an acne eruption, and she was running an evening temperature with a subnormal temperature during the day.

A thorough physical and microscopical examination had been made by her internist. Infected crypts in the tonsils furnished one source of infection. Tonsilectomy was performed February 28, 1915.

A Roentgenogram of the teeth showed a blind abscess at the apex of lower left second bicuspid from which the pulp had been extirpated three years previously and the tooth filled with amalgam.

The filling was removed February 8, 1915, and the upper three-fourths of the pulp cavity was found filled with cotton. Upon removal the cotton had a very foul odor and was saturated with pus and blood. The canal was irrigated and treated according to the usual technic for nine consecutive days with little or no improvement.

The tooth was considered incurable, therefore was extracted March 1, 1915, and the socket thoroughly curetted.

At the expiration of two months the acne is clearing up and the patient gaining weight and strength. Temperature practically normal and the nervous condition greatly relieved.

She gave no history of ever having any discomfort in the tooth, which, so far as she knew, was in a perfectly healthful condition.

Case 3. Mr. A. R. L., age 43, weight 210 pounds. Reported at Sanitorium in Indianapolis February 5, 1915, for treatment of sciatic rheumatism. It was impossible for him to walk without the aid of crutches.

The internist made a very searching physical and also a microscopical. examination of the blood, feces and a urinary analysis. No definite diagnosis of any focus of infection could be made. Lithia tablets to be dissolved in water and salol as an internal antiseptic were given and a hydrotherapeutic treatment for two weeks was given, without any marked change.

At the conclusion of this treatment the patient was advised to seek the services of a dentist to see if oral foci of infection could be located.

Ten films were made of his teeth, as described in this paper.

Blind abscesses with necrotic areas were located at the apices of the upper left cuspid and lateral incisor and upper right and lower right first and second molars. The affected upper teeth were all crowned with finely-fitted and beautifully-matched Logan crowns.

Apical excision was performed upon all the affected upper roots February 19, 1915. The abscessed lower teeth were treated through the canals and a beautiful result was accomplished.

Two weeks after the teeth had all been treated the patient discontinued the use of his crutches and began using a cane for support. In a letter dated May 10, 1915, he writes: "I held my cane for about a week after returning. I arrived March 11th. Then, on about March 20th, threw the cane away and have been going on my own resources ever since. I improved much faster than you and Doctor Hamilton predicted. I have no interference from rheumatism now and weigh 224 pounds, and I have taken no medicine at all."

Case 4. Mr. J. W. C., age 38, weight, 135 pounds, had been a sufferer for seven years from iritis.

His occulist could find no exciting cause and referred the case to the writer for oral examination. A set of ten films showed upper left first molar, upper right second bicuspid and lower left third molar had improperly filled pulp canals and blind abscesses with areas of necrosis at apices.

The patient could not afford the expense of surgical treatment of the teeth and the prognosis of therapeutic treatment being bad, he was advised to have the teeth extracted, which was done and the necrotic areas curetted April 12, 1915. He had six pyorrhea pockets around others of his teeth which were successfully treated.

On May 2, 1915, he reported great improvement of his condition, his sight was fifty per cent. improved and he has had no pain characteristic of iritis since the teeth were extracted and pyorrhea treated.

Many other cases are now under observation in which oral sepsis has been conclusively demonstrated to have been the etiological factor of the systemic dyscrasia, but the above data are of sufficient evidence to prove the dentist's responsibility to his patients and from the numbers of cases which are daily referred by the scientific members of the medical profession, we are coming to the realization of the respect which that great profession has for the services of the members of our equally scientific profession.

A great responsibility is ours and we are proving our worthiness of being classed as great benefactors to the human family.

DISCUSSION

Dr. J. A. Stoeckley, South Bend: I wish to compliment the essayist on the very able and highly instructive paper just read to us, and to congratulate our society in having a member who is capable of delivering a thesis of such scientific merit. At last Indiana is coming into her own, and instead of importing oral surgeons from our neighboring states we can now label ours "Made in Indiana," and I think we will all agree that the product is inferior to none and superior to many.

I practically agree with the essayist, and merely wish to elaborate some of the points. I do not think he has laid enough stress upon the importance of the work, and I would go a step farther and say that our profession itself does not appreciate the tremendous scope of our work. I do not believe the physicians as a profession appreciate the value of our work, and do not give us the just due that is ours in these cases. The physicians are taking notice of and bringing to our attention oral foci of infection as causing many systemic diseases, and perhaps at times are overstepping the boundary a little; they are blaming every known disease, where they cannot discover its origin or its cure, onto the teeth. While I think in the past our profession has been at fault in many cases of poor root canal fillings and improperly constructed crowns and bridge work, etc., I do not believe we are responsible for all the diseases for which we are blamed. I do not believe the medical profession should tell us, as they attempt to do, what teeth to extract. Doctor Lucas reported a case to me, a very recent one, where a physician sent a patient to him directing him to extract three teeth. Doctor Lucas decided that none of the teeth should be extracted, but that one of them should have a root amputation. I think we should carefully diagnose such cases ourselves, and try to determine what should be done, and if it is possible to save the teeth, we should do so.

I hardly believe that oral hygiene and prophylaxis can be overdone, although Doctor Black, in his new work on Dental Pathology, mentions a great deal of harm being done by careless prophylaxis. He speaks particularly of the too frequent use of the tape, of pumice stone and sand paper disks and strips, and things of that kind, and claims that a great deal of pyorrhea and other abnormal conditions of the gums are caused by our so-called "modern" prophylaxis. That point, coming as it does from a man like Doctor Black, is worthy of consideration.

As to diabetes, arthritis and diseases of that sort, I think the fault lies in our educational system. The profession in general does not take the matter seriously. Ninety-nine per cent. of the laymen and half of the profession do not believe it is true that these systemic diseases are caused by oral foci of infection, and it is the duty of those of us who do believe it to make the other half believe it, and then to educate the public with reference to it. Our dental colleges should educate their students along that line. I was glad to hear Doctor Henshaw say they were going to lay particular stress on the technic of gold inlay work, but I sometimes think we lay too much stress on mechanical work and not enough on surgical work. We should have more of our profession practice dental oral surgery. As a rule we are afraid to cut into tissue, or when we do cut in, we do not cut enough, just as in tooth structure; many imperfect fillings are made because we do not believe in prevention by extension.

The day has come when every dentist should take pyorrhea more seriously. The country is being flooded with circulars from all the pharmaceutical houses, each with a cure for pyorrhea, emetine or some other drug. They are flooding both professions with statements that pyorrhea can be cured by nothing else than taking the drug, and some of the dentists as well as some of the physicians are trying to cure pyorrhea that way, without the aid of instrumentation. I know of some physicians who are prescribing emetine right and left, and never mention to the patient that he should have surgical treatment or instrumentation. We should take those things up with the physicians. They wouldn't approve of our treating some of their diseases, just our part of them, without the medical part.

As to the X-ray, I do not believe we have begun to give it the importance it deserves. I believe it indispensable, not only to oral surgery, but to the general practice of dentistry of today. The paper this afternoon on gold and porcelain inlays brought that out very well. I am beginning to believe more thoroughly in the preservation of the pulp. We can all fill root canals perfectly if the root canals are in normal condition, but many times they are such that no one, no matter how expert he may be, can fill them perfectly, and I believe the day has come when nearly every dentist should have an X-ray in his office to take a picture of the root canal before and after it is filled. In the future the dentist may stand a good chance of having a malpractice case brought against him where some systemic disease follows an imperfect piece of work, and without an X-ray which will prove we have done our work well, we may have a difficult time in defending such a suit. I believe the essayist's idea of taking X-rays of the whole mouth an especially good one. A case came to my attention today, where there was a very bad blind abscess. The man hadn't the slightest idea there was any trouble, and almost by accident had an X-ray taken, and discovered the patient had a blind abscess and necrotic area in the roof of the mouth, and after Doctor Lucas performed the operation this morning, you could put your two fingers into the area. If an X-ray of that had been taken long ago, just see what trouble and suffering that patient would have been saved. We say that it is hard to get a patient to go to an X-ray specialist and have the entire mouth X-rayed at a cost of from $5 to $25, but we should educate our patients and show them that it is absolutely necessary, and I think it can be done.

I was pleased with the essayist's denunciation of worthless filling materials, and I believe his statements might be made somewhat stronger. To my mind those preparations are the cause of more of the aforesaid pathological lesions resulting in sickness and many times in death than all the other causes put together. We should stop advising the patient, "If the tooth doesn't hurt you, let it alone." I am not very strongly in favor of vaccines; I do not believe in stock vaccines.

Root amputation, I believe, is one of the most important operations in modern dentistry, and it is not employed one-tenth as much as it should be. The majority of our men sidestep root amputation; they say I will just extract that tooth; it won't last long anyway. We are timid about going into the soft tissue. It is as easy to go into the soft tissue, and in my opinion easier, than to go into the hard tissue of the tooth. I have employed the method the essayist has mentioned in root amputation many times, particularly referring to the flap, but in many cases I think the cross-incision is as good and sometimes preferable, especially where you have a large fistulous opening. I prefer to use local or conductive anesthesia unless the tooth is in too acute a condition, and then I prefer a general anesthetic. I do not believe strongly in nitrous oxid and oxygen for root amputation. I believe you should take your patient to the hospital, and use a general anesthetic, ether or something similar, so you may take your time and do your operation not hurriedly, but conservatively. I think Doctor Lucas is the originator of the method of filling the root canal from the apical end with amalgam, and I do not think there is anything better than that method.

One point I think we are weak on generally, and that is when we do get a tooth that is badly abscessed and too far gone for root amputation, and we extract it, we extract the tooth and let it go at that. In such a case the socket should be curetted. When you amputate your root, you curette the surrounding area of bone, and it is certainly more necessary when the tooth is so bad that it must be extracted.

Dr. John F. Barnhill, Indianapolis:* I cannot discuss a dental paper in the true sense of dental knowledge, and I shall not try. There are, however, certain broad principles of pathology of the mouth which apply to dentistry just as they apply to everything else pertaining to our health. I was struck by the remarks of Doctor Stoeckley in discussing Doctor Clevenger's paper, concerning the disjointed relationship between medicine and dentistry. As he emphasized, this relationship is not close enough, indeed the great surprise comes more and more to me and to others that dentists should continue to believe it necessary to have a separate dental society and that surgeons should have a separate medical society. We have the Indiana State Medical Association, with its different departments, and it would be advantageous and proper, and I think very helpful to you and to us if this society should be a department of our association, or we a part of your society, whichever one should properly dominate the other. Many of our members would like to hear your dental papers, and some of you perhaps might profit by hearing ours. If such an arrangement were brought about, it would no longer be necessary for the dentist to condemn the physician for not being up-to-date, and not necessary for doctors to condemn dentists for not telling them what to do.

The difficulty arises from the faulty plan of your education and mine; that is, from our professional education. Why should you have a dental college off by itself where nothing but dentistry is taught and why should we have a medical college where nothing but medicine and surgery is studied? You represent a very important branch of the surgical art, and we represent other branches; all are simply parts of the same whole and should therefore originate from a common source. Is it not necessary that dentistry should be taught as a part of medicine?

The paper was a very important one It told you about one phase of a very common cause of disease, the entrance of infection into the system. It is certainly true that all the diseases of which we have knowledge arise from a few sources. We have certain cases represented by traumatism. We can eliminate that because it has nothing to do with the paper. Then we have the great class of infections. These infections get into the body in various ways. Infection causes but little harm while on the healthy skin or an unbroken mucous membrane, but should the skin become lacerated or the membrane broken down, in come numerous germs, and as the essayist stated, our patients sometimes are poisoned seriously without knowing it and without suspecting the cause of their complaint. We ache a little in our bones, feel lazy as though we had a hookworm, or something of that sort, and we wonder what is the matter. The reason is that something has gotten into our system, some infection. The essayist has told us much concerning one such long-concealed and little-understood point of entrance. One of our great problems is to find where infection gets in, what its nature is, and then, the point in which our patient is most interested to know, how to get rid of it. I do not work on the teeth at all, but I have occasion to look at the teeth often during the working hours of the day, and I can no longer look into certain diseased mouths without realizing that the teeth furnish a favorable focus for the introduction into the system of much infected material and that, therefore, if we are proposing to cure people, we must often look at the condition of the teeth. It is not to our credit that we have not, long ago, educated the people to take better care of their teeth and mouths. Some people swallow enough pus from their diseased teeth to kill them, were it not for the antiseptic property of the gastric juice. But with all the immunity which this juice provides, there is in aggravated instances so much poison pouring into the system, that such people cannot indefinitely remain immune. We must meet this situation, and it is my duty to help you and your duty to help me in adequately meeting it. We must work together to find the means for getting at the real cause for much of the infection that has heretofore gone undetected.

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The doctor properly and justly states that a bad tooth furnishes infection which may cause disease of the tonsil or of the kidney; such a tooth may also furnish material for endocarditis or for rheumatism, so-called. By the way, the name rheumatism is pretty nearly a misnomer, and if you help us, we probably will be able to eliminate it entirely. We are eliminating it as was done with the term "neuralgia." Already when one asserts that he has rheumatism, his educated neighbors smile, knowing that usually he is in error.

Whereas the teeth may infect the tonsil, etc., a diseased tonsil may in turn do the same thing for the teeth. If a man has a diseased tonsil or a diseased nasal accessory sinus that is draining into his mouth, when he expectorates he will drag some of that pus over the teeth, and if there is a beginning breakdown anywhere around the teeth, some of the streptococci or pneumococci may lodge in the gums and infect them in that way. There are numerous other foci of infection about the head; indeed I sometimes think of the skull as a labyrinth of cavities surrounded by thin osseous tissue and of each such cavity as a possible focus of general infection. If you would take the lining membranes of all these cavities, the ear, frontal sinus, maxillary sinus, ethmoid and spenoid sinuses, spread them out and join them together you would have many square inches of mucous lining which in many instances is suppurating from early life till old age. It is by reasoning in this practical way that we may form an accurate notion of the extent of these cavities, and their importance as foci of infection when once diseased.

Doctor Stoeckley has said that if you tell a man that his rheumatism comes from his teeth, he won't believe it. He isn't educated to it. When you tell him he should spend $25.00 for an X-ray, he doesn't want to spend it. He would rather spend $25.00 on some worthless patent stuff, and then come around when he must and spend a larger sum with the dentist or doctor as a last resort. It seems entirely natural for people to spend their money doing the wrong thing. Prophylactic education should be begun in the public schools; we should educate teachers, parents, children and patients; should tell them why we need an X-ray and why we cannot always treat successfully until we get one.

I would beg to differ with Doctor Stoeckley in his belief that every physician should own and operate an X-ray in his office. I am a believer in expert knowledge and therefore I think we should have an expert to do that work who doesn't do anything else, whose pictures will be so perfect that the layman may understand; who does not burn his patients, as untrained Roentgenologists sometimes used to do; X-ray work is expert work, just as oral surgery is.

There are no bigger subjects in all medicine than the ones pertaining to infections. If we knew the infections, knew how to discover their foci, and how to deal with them when once discovered we should, as the essayist has said, eliminate a great deal of the misery from the world.

J. W. STAGE: A bright little boy recently wandered into my dental office to have some work done. He had been schooled by his very careful mother about taking care of his own mouth. As he approached the dental chair, the dentist appeared from the laboratory, and asked little Daniel to get into the chair. He looked up at the dentist and said, "Doctor, I didn't see you wash your hands." The dentist said, "I washed them just before you came in." "But, Doctor, I did not see you wash your hands." "But, Daniel, I washed them before you came in." "But I didn't *see* you." The point I wish to make is this: the people haven't been seeing us do enough of the best that can be done. The majority of our patients want the very best that we can give; consequently it is for us as general practitioners to do what we do to the very best of our ability. We know that these foci of infection do cause these many troubles; consequently as a general practitioner it is my duty to give the best attention and most careful work to these various things.

W. R. MEEKER, Peru: I also take exception to what Doctor Stoeckley says about the X-ray. We couldn't all become expert operators with the X-ray. I take exceptions also to his statement that each of us should do more cutting in the soft tissue. The surgical cases are so few that the ordinary practitioner is not justified in cutting on his patients when he has had little experience in that work. I had two surgical cases in the last year which I referred to oral surgeons. In one of these cases I was advised to operate myself, but there were two reasons I did not; I did not have the nerve, in the first place, and then I had a little too much judgment to do so. We have had two operations in Peru by local surgeons that should have been taken to a dental surgeon, and in both those cases the operations were failures, the necrosis was not entirely removed and the result is it has recurred. They operated in both cases without X-ray pictures. We have no X-ray operator in Peru equipped to take oral pictures.

Referring to Doctor Barnhill's suggestion, I do wish we might have our medical and dental meetings lap one day. It would do us all much good. In Peru the dentists and physicians get together. We discussed emetine. One of our local dentists told me he had a patient sent to him by a physician to find out whether he had pyorrhea, with the statement, "If you have, come back to me; I can treat it as well as he can."

I have in my care a lady with a badly diseased antrum; she is not in position to pay any reasonable fee for an operation. I described the case to Doctor Lucas, and he told me they were prepared down here to handle cases of that kind, and that practically her only fee would be her railroad fare to Indianapolis. If he would tell you about that, I believe it would be a very good thing for the dentists and for their patients.

DR. E. R. KIBLER, Indianapolis: I want to stand with Doctor Stoeckley on the X-ray proposition. Perhaps it is because I have never had any experience with the X-ray, but since I returned home a week ago I have had more experience in one week than a lot of us have in a year, and it has been mighty uncomfortable. Doctor Lucas operated on Mrs. Kibler this morning for a blind abscess that had been in her mouth ten years. To let myself out of this trouble, I will say that I have only known the lady two and a half years, but where I am at fault is that I didn't have sense enough to have an X-ray made of that lateral when I first became acquainted with her and relieve her of this pus which she has been absorbing for the past eight years. (The tooth being very dark and showing faulty technic.) I have had her in the hands of every specialist in town and one of the biggest in New York City to try to find out what her systemic trouble was. They couldn't find anything the matter with her. I was in the office of a friend of mine, a radiographer in New York, and I said, "Fred, I wish you would take an X-ray of that lateral." He did, and it showed a necrotic area in her mouth, almost the size of my thumb. I am not surprised that she has been having systemic trouble. I think I am not exaggerating when I say that three hours after that operation I could notice an improvement in her. I believe in the future to protect ourselves we are going to be compelled to make an X-ray of every tooth we operate upon when the root canals are involved. I have under treatment a comparatively new patient, with a putrescent pulp in a molar. Just before I went away for a post-graduate course I gave this patient one treatment. This tooth had never bothered her much, but she wanted her mouth put in condition. It was a lower left molar that had an amalgam filling in it, and it had darkened, and she wanted it bleached, if possible, and a gold inlay put in. When I came back I sent her to a radiographer, and he found a blind abscess at the end of that molar. Now I could have treated those root canals and sterilized them, given her relief, gone ahead and filled the root canals, put on a crown or an inlay and dismissed the patient, cured as far as I knew. What would be the next thing I would hear? The molar would be giving her trouble. She would go to some other dentist, some up-to-date dentist, and he would make an X-ray; or perhaps her physician would, and they discover the blind abscess at the end of that molar. I would be blamed. I treated that tooth just two years ago, and there is a blind abscess.

That blind abscess was there when she entered my office. I am to blame for not finding it. If we do this work through an X-ray specialist, we will select our cases, and will not send the cases to the specialist that we perhaps should; if we have an X-ray machine in our office we will X-ray every case, and become expert in the art. I am going to look into it and if I have brains enough to master the X-ray, I am going to have one, and I am not going to be caught without some proof as to what is on the ends of those roots that I am working on.

Doctor Eubank: Some of us in the country do not have many patients, and cannot go to the trouble and expense of calling a specialist, and yet our people have blind abscesses the same as people in larger places. We should have X-ray machines scattered through the country so that we could get to them easily. I believe each locality should have an X-ray machine. It might be a solution of the problem if each local society would get one, so that each member might have access to it, and if one man got expert with it, that would be a good thing, too.

The physicians and dentists have been too far apart, but they are getting together. A couple of weeks ago a physician came to me one Sunday morning and said he wanted me to go out in the country and extract some teeth; that he had had a lady patient he had been treating since last November, that he was getting no results and she was getting worse; that she had developed a heart lesion, the heart was leaking badly; that he had told them he thought the trouble was in the mouth and that she must have something done with her teeth. I found a bad case of pyorrhea, and found three abscesses. I extracted the teeth, and scaled the tartar from the others, and in one week's time the heart lesion had improved, for the leaking had stopped, and the physician said his patient was improving nicely. I believe if we would work together, we would get good results.

Dr. C. D. Lucas, Indianapolis (closing): There seems to be nothing for me to say, in retaliation, at least. The reason I described the technic for root amputation is because I feel that almost every dentist who wishes to undertake it can perform the operation and do it successfully. If a man is adverse to doing that work, he had better not undertake it at all. It is an operation which requires a considerable amount of time; one root amputation takes from an hour to an hour and a half, and it requires extreme care to do the work properly. But I believe any dentist who has the usual mechanical skill can perform this operation, and I think more of us should do it.

As to each man having an X-ray machine in his office, I do not believe that is opportune. The medical and dental professions are individually specializing along certain lines, and I believe Doctor Barnhill is right when he says the man who handles the X-ray should be a scientific and an expert man. A poor X-ray picture is worse than none, and it will take us some time to master this work so that we may take good pictures. Doctor Eubank's suggestion appears to be a good one, and might solve the question. I believe there should be an X-ray apparatus in every community, and someone who knows how to operate it.

Doctor Barnhill is right when he suggests that the two professions should get more closely together. I have been contending for the past ten years that the Indiana University should have a medical and dental department, which should be very closely associated, and I think the time will come when the Indiana University, like the University of Michigan, will have dental and medical departments so that we may all get the best results in our individual fields of endeavor.

With reference to what Doctor Meeker said, I wish to advise some of you that about a year and a half ago there was an active department of oral surgery instituted in the Indiana Dental College. Doctor Hunt had the foresight to see the importance of this work, and he incorporated in his arrangement in the college, one room which is fitted for oral surgery. All through the school year, from October until June, we have an oral surgical clinic for the senior students, and are glad to receive cases for operations from dentists throughout the state. At each one of these clinics, held every Wednesday afternoon from 2:30 until we get through, two of the senior students are my assistants, and I try to take them through as nearly as possible the hospital routine. By sending your charity cases to the college you will assist the senior students. There are certain operations, like those for cleft palate, which cannot be done in the dental college clinic, but we have taken care of these cases in the hospital when the patients could not afford to pay for the operation, without any expense to the patient. It should be distinctly understood, of course, that we do not want any case to come to the dental college clinic if the patient is able to pay for the operation.

I thank you for your courteous attention.

TONSIL AND ADENOID PATHOLOGY AND ITS INFLUENCE UPON HEALTH AND THE DEVELOPMENT OF THE ORAL CAVITY*

BY WILLIAM F. CLEVENGER, M.D., F.A.C.S., INDIANAPOLIS, INDIANA

PATHOLOGICAL CHANGES in the lymphoid ring which forms the faucial, pharyngeal and lingual tonsils may result in serious disturbance to health generally or may produce, by obstructing normal breathing in the developmental period of life, permanent deformities in the facial outlines. Abnormalities of these glands, therefore, should be of interest to the physician and dentist as relating to the problem of mechanical obstruction to breathing, and to that of systemic absorption of pathogenic bacteria through the cervical chain of lymphatics connecting this region.

The tonsils in the diseased state act as portals of entry for septic bacteria and should be understood to have direct influence upon the general system, especially upon development, physical and mental, and when hypertrophied produce obstruction to breathing, which condition naturally militates against proper absorption of oxygen. Both conditions mentioned result in a toxic state of the body and are of vital importance as applied to the question of health.

Septic infections in general of a chronic or acute type may be traced to chronically diseased tonsil glands, to sinus infections, diseased teeth or adjacent alveolar process, to the intestinal tract or to abscess cavities in any part of the body, as the appendix or gall bladder region, but of the various sources possible the tonsils and teeth are perhaps the most conspicuous for the reason that the mouth and throat are exposed to active bacterial invasion.

The diseased tonsil is usually enlarged beyond the normal, but this rule is not by any means invariable. Small tonsils imbedded are often exceedingly troublesome as carriers of disease-producing bacteria and are quite apt to be overlooked in the cursory examination and passed as normal, whereas there is perhaps more real harm done by the innocent appearing tonsil than by the conspicuous type, for the reason that the latter class of cases represents an open surface and drainage is far more likely to occur than in the submerged gland where the tissue is covered with the tonsillar pillars and septic material is retained, more or less, and taken up by the blood supply.

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*Read before the Indiana State Dental Society, 1915

There is also to be considered the fact that the large tonsil is ordinarily recognized as abnormal, and attacked sooner or later, while the smaller gland is too often left to its own devious course.

Since the advent of modern tonsil surgery, namely, complete enucleation of the diseased gland, it has been repeatedly demonstrated by many observers that chronic post-tonsillar abscess cavities are found in a large number of previously unsuspected cases, and that enlarged crypts and other changes of a pathological nature in the tonsil substance and surrounding structures due to active or passive inflammatory changes, are present in a far greater number of cases of general sepsis traceable to this source than was formerly appreciated.

The tonsil crypts, acting as receptacles for pathogenic bacteria, add greatly to the danger of absorption relative to the general circulation and may be considered in most instances to be the source of retro-tonsillar abscesses of the chronic or acute type.

The structure of the tonsil macroscopically and microscopically varies according to age and also in relation to the amount of change which has taken place in the gland from repeated attacks of inflammation. In early life the tonsil is composed almost wholly of lymphoid tissue, while in later years, usually beginning after puberty, there is shown under section fibrous tissue in abundance lacing through the gland. In the soft lymphoid type there is, therefore, little likelihood of more than mechanical obstruction to breathing except in the acute infectious ailments, and the systemic disturbances so frequently encountered in the adult of a more or less chronic nature may be considered in the young as improbable.

That the child may suffer repeated attacks of inflammation of the tonsillar tissue is well understood and that these attacks may be most disastrous relative to his well-being is fully appreciated; but we do not in early life find the same tendency toward chronic post-tonsillar infections and the resulting disturbances of a lingering character so frequently encountered in the adult who is absorbing through his chain of lymphatics toxins often of a most significant nature.

The character of infection emanating from the faucial and pharyngeal region should be of interest to both the physician and dentist. Necessarily both are brought more or less constantly into close contact with its sequela and in consequence must appreciate the far-reaching influence of systemic distrubances traceable to this source.

Modern understanding of many of the serious inflammatory affections of the heart, kidney, muscles, joints, and especially the ductless glands, brings us to a full appreciation of the subject under discussion. Thyroid hypertrophy, according to a concensus of modern opinion, is shown to be the result in very many instances of infection traceable to diseased glandular tissue adjacent to the thyroid region.

Arthritis in general is, without doubt, most frequently encountered where diseased tonsils are present and is shown in a large per cent. of cases to have its origin in streptococcic or staphylococcic infection of the tonsil glands primarily, or to result from toxins arising from this source.

The various inflammatory affections involving the heart, such as endocarditis and pericarditis in particular, and other inflammatory conditions in general, are most frequently associated with or result from tonsillar infections.

Nephritic affections may be, in many instances, traced to throat infection primarily, but we more frequently observe the inflammatory conditions involving the kidney to be due to extension from bladder inflammation or associated with faulty bodily elimination, as the inactive intestinal tract, skin or other pathological conditions dealing with the abdominal viscera or cutaneous system. It is not, however, impossible to have serious lesions arise in the kidney from a virulent throat infection and this possibility should be borne in mind in the diagnosis of these affections.

Mastoiditis is perhaps the most frequent sequela of acute tonsillar infection, and it has been repeatedly demonstrated by bacteriologists that the middle ear discharges may contain any or all of the bacteria possible in tonsillar infections, including the Klebs-Lœffler bacillus. Chronic or acute middle ear inflammations are dependent upon and are the direct result of nasal and throat abnormalities in a very large per cent. of cases, and should be so considered.

It may be stated as a general law of pathology that mechanical obstruction to drainage of any secreting cavity tends to result in local morbid processes and in toxic or infectious manifestations in remote parts of the body. This law applies to the tonsil, and especially to that type where natural drainage of the crypts is impaired and which in consequence results in chronic abscess cavities between the capsule and constrictor muscle. These cavities are most potent factors in the causation of low-grade septic conditions frequently encountered—and often erroneously diagnosed—and should be understood according to their significance.

Development and normal functionation of the glandular system is, as is well known, dependent upon cell activity and especially is this true in the young. Perfect elimination is impossible without proper respiration and normal absorption of oxygen, and the latter function can only be performed in a physiological way under favorable conditions.

Adenoid and tonsil hypertrophy in the child is, therefore, a subject of vital importance as relating to mechanical obstruction, to breathing, and to physical imperfections in general, and should be considered not alone from the standpoint of acute systemic infections as already mentioned, but should be understood to act as direct causative factors in the production of dental irregularities and oral imperfections in adolescence by excluding nasal breathing throughout the early years of life.

Nasal breathing is a physiological act and a necessity in the normal developmental process affecting the outlines of the face. The function mentioned is influenced in proportion to extent of tonsil and adenoid hypertrophy present, and materially affected by the natural inherited lumen of the air spaces through the nasal organ itself. It follows, according to the facts stated, that nasal obstruction may be either inherited or acquired.

Acquired deformities of the nose, other than traumatic conditions, are very closely related to dental surgery, and especially to orthodontia. It is thus apparent that imperfect nasal breathing in early life must of necessity influence formation of the maxillary bones, and that the development of the oral cavity may, in many instances, be changed from the normal prior to adolescence in the persistent mouth breather.

Granting the statements formerly made, it follows that imperfect nasal breathing, whether due to nasal obstruction proper or to post-nasal abnormalities, is of serious import to the person thus afflicted and should be considered not alone from the standpoint of respiratory comfort but from that of mental and physical development as well.

It is interesting to note statistics from some of our crowded centers bearing upon mental development. Obstructed breathing is shown conclusively to influence memory in a direct and positive manner and in summarizing the percentage is quoted by Prof. Arnold, of the New York City public schools as follows:

"In all cases of obstructed breathing from whatever source, there is shown a loss in the results of memorizing verbal matter of ten to thirty per cent., and where the work is new and difficult the loss is frequently as high as fifty per cent."

Obstructed breathing may be considered in part as a form of distraction, but the real influence is the devitalizing effect produced upon the body through diminution of supply of oxygen.

This subject in the present period since the advent of modern and scientific methods of management of septal deformities and the radical tonsil and adenoid operation, is generally understood to mean more to the young in the stage of development and to the adult who is insufficiently oxygenated or who is absorbing toxins through his chain of cervical lymphatics, than did the same in former years when surgery of this region was imperfectly understood and performed.

Various factors enter into the causation of nasal obstruction. Heredity plays its part and is important. Under this heading we may consider not alone the formation of the nasal organ at birth, but the hereditary tendency of certain subjects to hypertrophied lymphoid tissue in the pharynx or nasopharynx, which tissue plays so important a part in the formation of the superior maxilla and through this medium influences directly the formation and position of the nasal septum.

That the septum may be deviated markedly in the developmental process in many subjects by neglected adenoid and tonsil hypertrophy in early life, is the consensus of opinion, and indeed it is a question if the same does not enter into the causation of septal irregularities far more frequently than does trauma.

Imperfect breathing due to structural deformity of the upper maxilla in the young, resulting from adenoid and tonsil hypertrophy and neglected after the removal of these growths, is therefore unquestionably a potent factor in the causation of nasal deformities in adult life. It follows that the majority of post-operative tonsil and adenoid cases in children should be placed under the care of a competent orthodontist for correction of this deformity and if the same is not done indifferent results relative to breathing may in most instances be expected.

Few children breathe properly for years, if ever, after the removal of enlarged tonsils and adenoid mass, unless the above-mentioned rule is observed, as in these cases the arch of the superior maxilla—in most subjects—will be found not alone higher than normal but constricted and narrowed in a manner which forces the teeth to protrude beyond the usual line, thus precluding the possibility of the mouth being closed in the ordinary way. This deformity is present in a large per cent. of children in whom the hypertrophied tonsil and adenoid condition exists to any extent and should receive the post-operative attention the importance of the subject warrants.

The same degree of deformity naturally affects the development and position of the nasal septum, and unless remedied by orthodontic measures in early life, before the age of twelve, must, in very many subjects, result eventually in the necessity of a radical operation for correction of septal deformity.

Environment and its influence upon the development of the nasal organ, the glandular system, and chemical formation of tooth substance, is a subject worthy of careful thought. It is inevitable that the person who is poorly nourished in the matter of food and air and who in consequence is under-developed physically and mentally, will suffer proportionately, not alone in his respiratory organs but in his physical resistance, and especially does this apply to the osseous system.

The influence of impaired health upon the development and preservation of the teeth is certainly a most important problem and one frequently not fully understood by the layman, and in some instances is appreciated in differently by the physician and dentist. Normal tooth substance in man is not unlike, chemically speaking, the osseous system, and it follows that the bony structures may be more fully understood by comparison.

Completely developed enamel is the hardest structure of the human body and is known to contain the least amount of water and the greatest quantity of mineral substances of any of the osseous structures. The lime salts comprising the formation of tooth substance is materially affected by any or all of the debilitating diseases of childhood and none is of greater significance than the toxic, anæmic state induced in the under-developed adenoid and tonsil subject. Preservation of the teeth is best maintained in normal mouth secretions and it is well known that the alkaline character of the same is changed from the normal when the glandular system connecting the oral cavity is impaired. This same fact holds good when applied to stomach digestion, as the salivary secretions enter into the latter function.

Syphilis and other diseases affecting the bony structures, such as rickets and mal-nutrition in general, may be considered as likely to affect the character of tooth substance, and any of the debilitating ailments of a lingering character found in childhood certainly influence perfect chemical formation or preservation of bone or tooth structure.

Diseases of adolescence may influence the teeth, according to the amount of depreciation of calcium salts, and this defect is known to be especially well marked in pregnancy and lactation.

To sum up, we have to consider in discussing the subject before us health as influenced by faulty tissue oxidation, absorption of pathogenic bacteria through the diseased lymphatic system, and deformities in the facial outlines resulting from mouth breathing, all of which, in the developmental period of life, may influence the physical and mental well-being of the individual. The osseous system of the child being imperfectly developed is especially liable to impairment due to the causes mentioned, and the teeth being of osseous formation must be considered as likely to suffer proportionately in chemical composition.

Tonsil surgery is indicated when sepsis is traceable to the faucial region, or when the subject is unable, from post-nasal obstruction, to close the mouth in the ordinary way, or when ventilation of the delicate middle ear is impaired. These conditions govern the indications for surgical interference far more accurately than do the acute inflammatory affections which result in temporary discomfort and which generally cause medical aid to be sought.

In the removal of the tonsil gland it is interesting to note the present-day methods in vogue. These methods are numerically as great as the men engaged in the work. Each operator has his own individual method, more or less, and all are striving in this period to perform the surgery with as little injury to the surrounding pillars and to the underlying muscular structures as is consistent with thorough work, namely, tonsillotomy. The old method of tonsillotomy has become obsolete and justly so.

The operation for the removal of the tonsils and adenoid mass must be thorough and at the same time the question of adhesions and undue scar tissue following the surgery remembered. No two cases will present the same clinical characteristics, and it is generally conceded that tonsil surgery is distinctly major in character.

Anesthesia is a most important problem in this work, and no operator can hope for satisfactory results in general without the co-operation of a competent anesthetist. It is generally understood that anesthesia for tonsil and adenoid surgery is the most difficult of any and should be undertaken by skilled men only. The deaths recorded will, we believe, be found in almost every instance to result from anesthesia improperly administered. Undoubtedly this is true, barring faulty surgical technic or the rare condition of extreme hemophilia sometimes encountered. Local anesthesia is frequently used in the adult case and is the ideal anesthetic under ordinary circumstances.

Tonsil surgery should not differ in its principles from other forms of surgery, from the standpoint of accuracy. It is difficult to see how the work done in many throats can be of a satisfactory character to the operator. Most of us will remember the excellent article written by Sheedy, of New York, and recently published in the *Journal* of the American Medical Association, in which he makes the statement that eighty per cent. of post-operative tonsil and adenoid cases presenting themselves at his clinic showed questionable results. This applied to scar tissue, hearing, voice, comfort of the patient, elimination of gland tissue, etc. Assuming this to be true, it is proven that the majority of operations performed on the tonsils are failures and worse than useless. There can be only one answer to this deplorable state, and this is improper preparation for the work on the part of a great number of operators, a lack of delicacy with which the subject should be handled, and poor co-operation between the surgeon, assistant and anesthetist.

Undoubtedly great good may be done by proper surgical measures in a large class of imperfectly developed children, and in many cases of general sepsis in the adult, if tonsil pathology is recognized. The hypertrophied tonsil and adenoid mass should, as a rule, be operated before the age of five whenever possible to do so, as there will usually be found after this period in life more or less change in the maxillary arch, nasal septum, and often in the middle ear.

It will be appreciated that a tonsil operation is not necessarily final, for there are, as shown in numerous instances, many degrees of efficiency in this work, as in other lines of surgery.

I regret to state that the slides intended for use in illustrating the subject just presented are not in condition to be shown and it will be necessary to omit this part of the program. I trust the society will bear with me in this omission.

DISCUSSION

Dr. Charles R. Jackson, Indianapolis: The excellent paper to which we have just listened serves to again remind us of the close relationship existing between the medical and dental professions.

The close pathological and physiological relationship of the nose, throat, mouth and teeth has only of recent years been recognized. Lesions of either were regarded as local and received local treatment.

It would seem, in the light of some recent medical literature, that from their former position of completely ignoring the teeth and mouth, our medical friends are in danger of going to the other extreme of attributing too many obscure septic conditions to dental lesions.

If you have not been impressed, during its reading, with the thoroughness with which the essayist has covered his subject, you will be, then, when reading it.

I fully approve of almost everything the essayist has said. I am even pleased to know that he still believes in inherited tendencies, contrary to the idea of some of our modern extremists who would have us believe that the character and condition of our progenitors is unimportant.

I rather question whether Doctor Clevenger said exactly what he meant when he said, "Unless this hypertrophied tonsil and adenoid condition is remedied early in life before the age of four or five, it must in many subjects result in the necessity of a radical operation for correction of septal deformity."

The orthodontist does not agree with this. He believes that any time during the developmental period of childhood proper orthodontic treatment following the surgical removal of post-nasal obstructions, will either correct entirely the septal deformity or so enlarge the nasal space as to make the septal deflection of comparatively little importance.

Doctor Wright, a rhinologist, of Boston, in a paper read before the American Society of Orthodontists, claimed to have accomplished the result in many cases even after sixteen years of age.

When considering the pernicious dental effects resulting from adenoid vegetation, etc., so far as deformities are concerned, may we not sum it up under the heading of imperfect functionation?

Inhalation of air through the nose is normal and is necessary to the perfect development of the sinuses and bones of the face.

Imperfect supply of air causes deficient oxygeneration of the blood followed by malnutrition.

Nasal stenosis results in deficient mastication, as we cannot, with comfort, use the mouth for the double purpose of breathing and chewing. As a result of this we have deficient stimulation to normal development from exercise. Perverted action of the muscles of the lips, cheeks and tongue are productive of physical changes. Of all these perverted forces, absence of the strong positive, stimulating pressure imparted to the process and bones of the upper maxillae when we have normal breathing or swallowing, is the most important. When considering these forces, which seem so neglible, we must remember how susceptible to slight, but constant forces, the plastic, bony framework of the child is.

It is surprising with what readiness the bones of the face of young children respond to slight pressure, constantly applied, in orthodontic treatment.

It seems that as civilization advances, pathological conditions of the mouth, nose and throat become more prevalent.

It may be of interest to you to know that septal deviations are rare in the Mongolian and African races. Dr. Wm. Wesley Carter, of New York, says he has never seen or heard of a non-traumatic deviated septum in a negro.

Those extreme cases of distal occlusion, with narrow upper arch, prominent incisors, constricted nasal spaces and badly deformed facial lines, which are characteristic of patients suffering from nasal obstruction, are all progressive and have a mild beginning. The discovery and removal of the cause in its incipiency would probably prevent the serious physical and pathological conditions which would otherwise result.

Cannot the dentist assist in this blessing by early recognition of the symptoms in our very young patients and referring them to the rhinologist for surgical treatment?

As the essayist has explained, the laity need knowledge of the fact that the acute inflammatory conditions are of minor importance, compared to the other serious results following neglect of this condition.

The statement of Doctor Sheedy, referred to by Doctor Clevenger, that eighty per cent. of adenoid and tonsil operations showed questionable results, is a rather serious commentary on the character of the surgery of this region of the body. We have seen too much of the "slipshod" surgery in the removal of tonsils and adenoids with their subsequent recurrence. It impresses us with the fact stated by the essayist that surgery of the nose and throat is major surgery and should be performed only by those properly qualified. In fact, should be limited to men specializing in surgery of this region.

Medicine and surgery have made such rapid strides that no man can keep pace with all its branches.

Dentistry has progressed to such a stage that a division of its labor is necessary if we are to give our patients the best possible service, just as it was found necessary in medicine.

The sum total of knowledge each of us may acquire in a lifetime is so little compared with the aggregate and the time and experience necessary to acquire proficiency in any line is so great, that we must limit our scope of endeavor.

Each of us is dependent upon the other, each with his little duty to perform, all for the good of humanity.

Dr. J. A. MacDonald, Indianapolis: I feel a little limited in the discussion of Doctor Clevenger's paper, for he has covered the ground so completely. Ten years ago no one dreamed that the department of the medical profession occupied in the treatment of the nose and throat would have such demands upon it as have proved to be the case. Suddenly there burst upon these men a tremendous requirement from the men engaged in clinical medicine. They entered upon a period of confusion in diagnosis and in the nature of the work required of them, and in the solution of the problems presented. But as there were in that body of men some of the best and brightest minds, and as it comprised some of the most energetic men in the medical profession, they arose to that occasion, and they have not only kept the pace, but are actually forcing it, so that those of us engaged in the study of systemic diseases have had to turn to them again and again for the solution of our many problems. There were skeptics then as to the reality of the problems presented, and skeptical of the information furnished by the nose and throat men. But this now has passed, and a fuller realization has come. I have talked to many members of the medical profession, and have come to the realization that the dental profession is in the midst of one of these tremendous epochs that burst upon every profession at irregular intervals. There is a presentation to them of many problems, there is confusion and discussion and dissension and skepticism, and sometimes over-enthusiasm, but beyond it all is an earnest endeavor to meet these problems, to solve them, and to give the information we request. With the spirit that is manifest in the dental profession, the constant raising of the requirements of education and of the standard of the students and the literature of dentistry, we see that the dentist will not only be a helper, but a leader and an informer, and we have turned to the dental profession to help us solve our problems. There is never a day in my office that I do not at least once say to a patient, "Have you seen your dentist lately? What does he say about your gums, etc.? If you haven't been to him, go to him and find out, and bring me the answer, because I want the relation of this mouth to certain conditions present in your body." I have met now and then skepticism among the dentists, and I think we can locate the reason for this skepticism. It is simply a parallel to what we met among the nose-throat men some time ago.

Now how can there be relation between the teeth and gums and the other parts of the body? It is because of the presence of the living bacteria in the blood stream. Having appreciated that to exist, the realization and understanding of the problems to be solved become easy. Doctor Clevenger's discussion of the mechanism of the production of mouth and nasal deformities through the combination of anatomic abnormalities and faulty oxygenation is perfectly clear and easily believable, and it is now an accepted fact. It was thoroughly presented to you, and none of you can look into mouths without understanding it. As to the mode of the production of systemic diseases he, I think purposely, said little about it. What are those diseases that are produced, and how are they produced?

To go back a few years: In about 1899, Klebs, and later Hectoen and others, discovered the presence of bacteria in the blood in certain diseases. They found that typhoid fever was not an intestinal disease. It has its focal inception in the lymphoid tissue in the intestines; then they go into the mesenteric glands, and then into the blood, and they found typhoid bacilli in the blood stream. Later the same thing was found to be true of pneumonia; the pneumococcus could be recovered in as high as 98 per cent. of the cases if the culture was made at various times throughout the fever. Later, these organisms become localized in certain places in the body, and make the individual a little sick. As time went on, in the studies of rheumatic fever, arthritis, sore joints, they found that body immunity came into a very active relation to this disease, and in studying the blood stream in these diseases in a certain number of cases certain bacteria were obtained from the blood stream, and they found certain organs were affected by these bacteria, namely, the heart, kidney, thyroid glands, gall bladder, urinary bladder and the lungs more particularly. Having discovered this, the mode of operation of this infection was studied more carefully. This included the tubercle bacillus. It was found that the infection, once having gained access to the blood stream from without, passed through certain organs from the blood stream; for example, tuberculosis of the kidney was primarily from the blood stream, and that it descended from there into the organs beneath, contrary to the old idea that it came to them from outside. This was true of numerous of the other germs. We searched frantically for years for every possible focus of infection, small places where infection lingers chronically and slowly. It was a long time before we took up the matter of the tonsil for the location of these diseases, and when we did find it there, we thought the problem was solved.

The nose-throat men devised better methods. The old harmful method of cutting off the top of the tonsil and allowing it to seal over and multiply infection so that the absorption of the blood stream became almost a certainty, was replaced by the careful, modern surgical operation. This accomplished a great deal; many cases of heart disease were prevented. That can be demonstrated in the same family or community, one child with the tonsil removed going through the rest of his years in safety, and the next, where tonsillotomy was delayed because of fear of the parents, becoming affected with heart disease or rheumatism. So that even the community at large has come to accept nose-throat surgery as perfectly scientific and for the best of the community. The better educated people all accept this. They will ask if this young girl, with the rapidly growing goiter, may not have something wrong with her tonsil.

Still came this group of cases which were not relieved, and where nothing could be found at fault, until the last few years we have turned to the dentists. This was best expressed in an article by Cecil, where in a group of a hundred cases of endocarditis, nephritis and arthritis, he found two cases undoubtedly due to infections of the gums. The infection in the mouth is a low-grade infection, accompanied by little fever, but able to produce after long lapse of time tremendous anatomic changes without making the individual go to bed. It doesn't make the patient sick enough to get such immunity as you get in typhoid fever. Your patient may be a little sick half a dozen times in a winter, and you realize you have something insidious to deal with, and do not have to have very bad gums to have them the source of infection. In those two cases Cecil found the streptococcus viridans, and he found them in the suppurating gums and in the heart's blood; then he found streptococcus viridans of the same type in the joints. Rosenow in a similar case took out the lymphatic glands in the region of a low-grade inflamed joint, and splitting that gland open, was able to obtain cultures of streptococcus of the same type as were obtained from that individual's mouth. So we are turning to those places for these foci of infection.

Abnormalities of the mouth are great producers of disease. So-called pyorrhea has brought about great confusion. I remember a case where I opened up the bowel, which was the seat of amœbic dysentery. This individual came from the South with amœbic dysentery, and we demonstrated that in the stools. He wasn't sick from any special amœbic disease, but because of septic infection and diarrhœa. His bowel contained great ulcers, which were excavated, and in them were amœbæ, but they were simply the local agent which allowed ingress of the bacteria to the blood stream which flowed from the bowel. Bacteria cannot attack normal, intact mucous membrane of the bowel, but given some animal parasite which can attack the mucous membrane or any other traumatic agent, ingress of bacteria is permitted and ulceration, however minute, is produced and absorption of toxins which make your individual sick.

This man developed an abscess of the liver, from which we took a great deal of pus, but in that found no amœba, just the ordinary streptococcus germs which were developing toxin which was killing the individual, but from the wall of that abscess I obtained amœba coli in abundance. Suppose your amœba is the animal which makes it possible for that bacteria in the mouth to get into the blood stream, and you then get the symptoms arising from the ingress of these bacteria into the body. If you had simply the streptococcus present, it wouldn't do any harm, because the body can protect itself against this bacterium, but in the presence of the animals which are breaking down the cell walls, the bacteria can obtain ingress into the blood stream and to the lymphatics which take their origin from the mouth and gums, plus the constant pumping by mastication, so that these toxins and bacteria are forced into the lymphatic circulation and blood streams.

So when we add our total number of available foci in the body for the constant retention and reproduction of organisms, we must now add to the tonsils and the others we formerly knew, the gums primarily, and secondarily, perhaps, the salivary glands, because we have had them long under suspicion as harborers of chronic low-grade infection.

DR. CARL D. LUCAS, Indianapolis: Doctor Clevenger stated that if natural drainage of the crypts of the tonsil be impaired there frequently results a low-grade septicemia. That reverts to the assertion of last night in my paper regarding the blind abscess being the worst kind of an abscess in the alveolar process. I can readily see how it is reasonable to suspect the crypt without drainage to be the worst sort of a crypt of the tonsil for producing systemic disturbance. In practically all cases of pyorrhea I have observed infected tonsils. It is not difficult to see the reason. The pus from the gums passes between the tonsils and some of it lodges there, infecting those organs. The internist or specialist in medicine who does nothing but diagnose disease conditions is certainly laying a great responsibility at the door of the dental profession. The members of the medical profession who are practicing Doctor Clevenger's specialty have an important role to play. They were called upon to do their duty before the dentist was called upon to enter the field of preventive medicine. These medical specialists have arisen to their responsibility, and the dentists all over the country are arising to their responsibility and I believe that the co-operation of the medical and dental specialists will tremendously enhance the future welfare of the individual. I was talking the other day to an internist and he said that Indianapolis is peculiarly fortunate in the ability of the men of our city who are practicing rhinology. He has observed conditions in many cities, and says Indianapolis is especially fortunate in having six or eight of the most able and efficient members of her medical profession in this specialized practice.

Doctor Clevenger mentioned the advisability of removing the hypertrophied tonsil before the individual reaches the age of five, and if the operation were performed before the age of five, it would not be necessary to resort to orthodontic procedure in order to expand the arch, and thereby eliminate the possibility of a deviated septum. I am much interested in that proposition because my young son was operated upon for adenoids and tonsils at the age of thirty months, and his teeth are now somewhat irregular. I should like to know whether it is necessary to have his temporary arch expanded in order to overcome the possibility of his having a deviated septum. Doctor Mitchell advised me that there is an orthodontist in New York who specializes in the regulation of children's teeth. Perhaps Doctor Clevenger has been observing the special work which this orthodontist is doing and has become overly enthusiastic about the correction of deciduous teeth and arches. I wish to acknowledge my indebtedness to Doctor Clevenger for much instruction which I have gained from his excellent paper.

DR. HOWARD R. RAPER, Indianapolis: I do not know whether we fully appreciate having Doctor Clevenger and these other gentlemen appear before us. I tried to follow Doctor Clevenger for a day or two, and he kept me up until one o'clock at night, and got me out again at half past six the next morning, and when you get a man like that to prepare such a paper for us and come here and read it to us, we should appreciate what it means.

Naturally, when one physician and a lot of dentists get together, or one dentist and a lot of physicians, there is always talk of the correlation between dentistry and medicine. Now, as a matter of interest, suppose we review the history of the relationship between mouth conditions and general health, and see where we are going. Up to the discovery and development of bacteriology, the only relationship we knew to exist between the mouth and general health was summed up in this way: without good teeth you cannot have good mastication; without good mastication you cannot have good digestion; without good digestion you cannot have good assimilation and nutrition, and without good assimilation and nutrition you cannot have good health. Something like for the want of a nail the shoe was lost, etc. And today that is the only fact regarding the relationship between general health and mouth conditions which is fully understood by everybody. I go down on the street and ask the first man or woman I come to, "Do bad teeth cause stomach trouble?" And the answer is, "Yes, sir." Everybody knows it. Then came bacteriology and we learned that a number of pathogenic bacteria lived in the mouth, and the more unhealthy the mouth, the more bacteria lived in it; consequently, that an individual with a dirty, unhealthy mouth was more susceptible as a child, to measles, diphtheria, mumps, scarlet fever, and so on, the bacterial diseases of childhood, and as an adult, more susceptible to pneumonia, tuberculosis, typhoid fever, the whole list of infectious diseases. We first find nutritional diseases and then the infectious diseases due to mouth conditions—and most diseases are either nutritional or infectious.

Then comes the theory of metastatic infection, and that takes in endocarditis, nephritis, arthritis, cholestitis, and so on, so that if we take the matter too literally, we will be believing that the mouth is solely responsible for all human ailments. I am not saying that is the case, or accusing any one else of saying so, but it doesn't seem possible that the mouth has the influence on physical conditions that some radical men believe it has. Where there is so much smoke, there certainly must be a little fire, and the theory of metastasis is so consistent and irrefutable, and has been proved so conslusively, that no one can dispute it. That brings us to the point where we see why Doctor Clevenger is here this evening. A few years ago these medical men wouldn't have been here, because we didn't have the same things in common; the only thing in common then was the consideration of the nutritional diseases due to some mechanical fault of the masticatory apparatus. Now we meet on a big field, and study the causation of diseases in general.

Doctor MacDonald takes the attitude, and I always like to see anybody take this attitude, that he and his profession are going to solve these problems of mouth influence. Doctor MacDonald, you are going to have to hurry if you beat us, because the National Association has established a research commission, and will build a building for research work which will rank with the Carnegie Laboratory for Research Work, and in which we will have men of equal caliber to the men in the other recognized laboratories, and we expect to come to some conclusions ourselves, and that pretty promptly. If any one in the hearing of my voice has not contributed his financial support to this commission he should by all means do so. At present there is so much we do not know, and recognize we do not know that the conscientious man hardly knows exactly what to do. We find mechanically imperfect canal fillings without abscesses, and we find mechanically perfect ones with abscesses. Of course we believe that a root having a perfectly filled canal is less likely to abscess. We do not know as much about dental radiography as we should. I would look with very great suspicion at anything I found in a radiograph which wasn't borne out by clinical symptoms, because there is a chance that the radiograph may mislead you. I am delighted to learn that eighty per cent. of the tonsillar operations are failures, or are at least faulty; that is exactly the same per cent. that some one gave us at this meeting regarding success in pulp canal fillings, so there isn't a great difference between the respective skills of the two professions.

A thing that was new to me was the possibility of the enlargement of the thyroid gland being due to some focus of infection. That adds still another disease which might be caused by a local focus of infection in the mouth, and when you add to all the diseases I have already mentioned some of the nerve diseases, various forms of tic and headache and insanity, also malnutrition, due to mouth breathing caused by a deformed mouth as described by Doctor Clevenger, you are certainly extending the scope of the dentist materially.

As a radiographer I come in contact with both physicians and dentists, and I notice that the attitude of the physician is "Oh, Poof, he is a dentist. What does he know about it?" And the attitude of the dentist is, "He is only a physician. What does he know about it?" There is a human tendency toward clannishness, and we must get over this. I noticed Doctor Langdon said something about the dentists not knowing anything about bacteriology for a year or so after the physicians recognized its importance. There isn't any difference between the professions; but this is a fact which must be borne in mind, you can learn more in four years than in three, and so we mustn't resent it when a physician seems to infer that he knows more about some particular thing than we do. If he does, all right; if he doesn't, you will have no difficulty in convincing him that he doesn't, because they are all open to conviction.

DR. E. L. MITCHELL, Indianapolis: The pathological phase of this paper has been covered, but Doctor Jackson seems to be the only one who has touched on the other phase of it, i.e., the developmental conditions produced by nasal stenosis. The rhinologist often fails in the restoration of normal respiration, simply because there is faulty development; due, as Doctor Jackson has said, to perverted functioning. There are certain functionating conditions responsible for the development of the lips, the nose, the accessory sinuses, and, in fact, the entire skull.

If we have normal muscular pressure, normal force exerted by developmental conditions, of erupting teeth, by the multiplication of tooth cells, if we have normal respiration, normal stimulation transmitted to the bone in mastication, and normal blood circulation due to this stimulation—then we will have normal development. If, on the other hand, a child has a bad condition of the tonsils or adenoids, or other nasal obstruction, improper mechanical stimuli results in a deficiency in development of these parts. If the upper lip is relaxed and is inactive, and doesn't perform its normal function in the act of swallowing, and counterbalance tongue pressure lingually, results are sure to be disastrous; for upon an equalization of these forces depends the development of the face.

One of the first things brought to our attention from an external view is the short upper lip. The multiplication of the cells in the eruption of the permanent teeth are forcing the teeth and process forward. We have lost the pressure of the tongue on the palate, because the mouth is open, and also the pressure of the lip on the interior part of the upper jaw, because it has failed to develop. Hence as there is nothing to stimulate its development laterally, because the tongue is back in the throat, and nothing to prevent forward development on account of shortness of the upper lip, the only natural thing then is a narrow V-shaped high arch, with protrusion of upper teeth.

If a child is breathing through its mouth, the tongue being back of its normal position obtsructs the passageway to the lungs, even through the mouth.

DOCTOR CLEVENGER, Indianapolis (closing): Doctor Jackson and Doctor Lucas have mentioned as a statement in my paper the age of four or five, and that if at this age the child were operated orthodontic measures would not be indicated. This is a mistake. A child at the age of four or five may have a badly deflected septum and the maxillary arch may be deformed. In such case the child should, of course, be placed under the care of an orthodontist following the removal of the throat obstruction and indeed this applies to any age prior to adolescence. The orthodontist cannot have opportunity to obtain the maximum results in any case until the throat and post-nares are clear.

PULP CANAL OPERATIONS

BY DR. W. H. JACKSON, ANN ARBOR, MICH.

In reading over Doctor Best's paper in the November (1914) number, with the discussions that followed, I was impressed with the fallibility of the dentist, as well as humanity generally. It is a self evident fact that every dentist should be honest. If he is honest he will give his best services to his patient whether he is remunerated or not. Else it is better to reject the case.

In dealing with pulp canal operations, we must not lose sight of the fact that a portion of the tissue is dead material, and it or some foreign material must remain in contact with the living.

Such being the case, there is always a weak condition at that point so that when the system is attacked by germs that produce inflammatory or feverish conditions, they may or will attack those points more readily than any other, lest there be a lesion in some other tissue more easily accessible. The great wonder is that the system will submit to such conditions at all.

I fail to find to any extent a greater proportion of successes in the treatment of abscessed teeth than was obtained between forty and fifty years ago, when we filled the canals after treating with gold, tin foil, or a bit of gold foil twisted around a fine broach to a fine point, melting a little wax or paraffin on it and then forcing it home. Yet with all the care, after ten, fifteen, thirty or forty years without any apparent trouble, micro-organisms have entered the system and sometimes set up inflammation at the apex of the root where the original lesion took place, sometimes causing a loss of the tooth as the result. Had the same systemic conditions occurred at any time previous there would, without doubt, have been the same results.

To be sure, by this great care we minimize the trouble and loss. Many a tooth is lost by enlarging the pulp canal at the apex, thereby bringing a larger amount of foreign matter in contact with living tissues which are not in harmony with each other. The larger the area of such contact the greater liability to have trouble in the future.

Owing to these conditions being always present in pulpless teeth, I was surprised at some of the statements made by some of those who discussed his very good paper, but I have been so many times disappointed in X-ray diagnoses that I hesitate to make any positive statements in any particular case. Even in the photos given I fail to see any betterment in some of the cases of the soft tissues beyond the tooth. In a case that I now am treating, the skiagraph shows a fully developed left superior central incisor, which never erupted, lying crosswise deep in the process.

In trying to bring it to the surface, I have removed two small spindle-shaped supernumeraries and the third tooth that is making its appearance begins to look as if it might be another, at least it shows an imperfect formation for a normal incisor. There is nothing in the picture to indicate anything but a single normal tooth in an abnormal position.

Though a tooth may be perfectly filled to the apex and not beyond, and though the same may be perfectly aseptic when it is filled, there is no positive assurance that it will never cause any trouble. Frequently they may not for years.

RELATION OF DIET TO DENTAL CARIES AND MOUTH INFECTION

BY J. H. KELLOGG, M.D., L.L.D., F.A.C.S., BATTLE CREEK, MICH.

(Concluded from page 766 September Summary)

Another important point closely associated with that of lime starvation is the question of relative acidosis. The fluids of the body are alkaline. Roger and other physiologists have clearly shown the importance of maintaining this alkalinity of the tissues. When the alkalinity is diminished, oxidation is seriously interfered with, the resistance of the tissues is lowered and all the bodily functions are disturbed. Pronounced acidosis gives rise to coma as seen in diabetes and starvation. Acidosis is also induced by the administration of ether and chloroform and perhaps other anesthetics also, and so is doubtless responsible for some of the more serious complications following severe surgical procedures.

Bunge some years ago called attention to the fact that in certain of our common foodstuffs acids are so predominant that the result of the metabolism of such foods in the body tends to lower the alkalinity and produces a state of relative acidosis. Bunge's researches show also that cereals contain a considerable excess of acids although this excess is on the average about one-fourth as much as in the case of flesh meats.

Numerous metabolism studies, especially studies of young children, have shown that a state of relative acidosis results in the loss of lime. This condition is often produced in children by an excess of fat which forms butyric acid in the intestine and thus robs the body of lime. This condition is much less frequently met with in adults but it is well known that in diabetes there is a greatly accelerated loss of lime due to the state of acidosis arising from the disturbed carbohydrate metabolism. In either true or relative acidosis the body loses lime and the teeth must suffer injury; hence it is highly important to see that the bill-of-fare is so arranged as to supply an abundance not only of lime but of other alkaline salts. Fortunately, foods rich in potash and other alkaline salts are very abundant. Practically all fruits and vegetables contain considerable amounts of potash and soda in the form of acid salts.

The organic acids, chiefly citric and malic acids, which are combined with alkalies, are readily burned in the body, leaving a residue of carbonates of potash and soda which neutralize tissue acids and maintain the normal alkalinity of the body fluids.

The following table, prepared from Sherman's late work, "Food Products," shows the reaction balance of various fruits, vegetables, cereals and meats:

	Excess of Acid.	Excess of Base.
Almonds		1.8
Apples		6.
Apricots		11.
Asparagus		3.6
Bananas		5.6
Beans (baked)		5.
Beans, string		13.
Porterhouse steak	4.	
Sirloin steak	3.9	
Bluefish	11.	
White bread	2.7	
Whole wheat	3.	
Buckwheat	2.	
Buttermilk		6.1
Cabbage		18.
Carrots		24.
Cauliflower		17.4
Celery		42.2
Chard		41.1
Cherries, fresh		7.8
Chestnuts		3.2
Chicken	10.	
Cocoanuts		1.2
Corn, green	1.8	
Corn meal	1.5	
Cranberries		3.7
Cream		.3
Cucumbers		45.5
Dates		3.2
Eggs, whole	7.5	
Egg white	9.5	
Egg yolk	7.0	
Figs (dried)		32.3
Flour, entire wheat	3.3	
Flour, wheat patent	2.7	
Fowl	4.6	
Frog's legs	12.1	
Haddock (smoked)	12.2	
Halibut, steaks	7.8	
Ham	5.5	
Herring (smoked)	6.3	
Koumiss		2.9
Lamb chops	3.	
Lemons		12.
Lemon juice		11.
Lentils	1.5	
Lettuce		38.6
Mackerel (fresh)	6.7	
Milk, skimmed		5.0
Milk, whole		2.6
Mushrooms		8.9
Muskmelons		19.
Oat meal	3.	
Olives		18.8
Onions		3.1
Oranges		11.
Orange juice		14.4
Oysters (fresh)	30.	
Parsnips		18.2
Peaches (fresh)		12.2
Pears		5.6
Peas (canned)		1.5
Peas (green)		1.2
Pineapple (fresh)		15.7
Plums		7.3
Pork, loin chops, lean	4.	
Pork, sausage	1.4	
Potatoes		8.6
Potato chips		3.9
Potatoes, sweet		5.4
Prunes (dried)		8.
Radishes		9.8
Raisins		6.8
Raspberry juice		13.
Rhubarb		37.
Rice	2.7	
Salmon (canned)	5.5	
Sausage, bologna	4.	
Sardines	4.2	
Shad	5.8	
Shredded wheat	3.3	
Smelt	10.1	
Spinach		113.
Squash		6.1
Tomatoes (fresh)		24.5
Trout, salmon	5.4	
Turkey	3.6	
Turnips		7.
Veal, breast	6.7	
Walnuts, California	1.1	
Watermelons		8.8
Wheat, cracked	3.3	
Whitefish	7.6	

Hindhede of Copenhagen, who has made an extensive study of this subject, has shown that the neutralizing power of the potato is so great that the urine of a patient subsisting chiefly upon potatoes dissolves forty to fifty times the amount of uric acid as will that of a person taking an ordinary mixed diet.

A research conducted in the laboratories of the Battle Creek Sanatarium a year ago last summer by Mr. Blatherwick, an assistant of Dr. Mendel of the Yale laboratory, showed that the tomato as well as the potato has remarkable influence in alkalizing the body fluids; but the most active of all common foodstuffs was found to be the cantaloupe. It was surprising to note how quickly an alkaline state of the urine might be induced by eating freely of this delicious vegetable fruit.

The importance of thorough mastication of the food as a measure of dental prophylaxis has come to be universally recognized. I think it important, however, to emphasize the fact that the quality of the food as well as the matter of chewing must be considered.

Thorough mastication is beneficial to the teeth, not only in promoting good digestion, and hence the general health of the body, but in three essential particulars, all of which have an important relation to diet.

1. Better blood supply to the teeth which results from vigorous use of the muscles of mastication.

2. Cleansing of the teeth which results from the abundant flow of saliva produced.

3. The scouring of the teeth by the contact of food possessing scouring properties with the dental surfaces.

Nearly twenty years ago, in the summer of 1895, I conducted a series of experiments which demonstrated that dryness is the property of the food which most stimulates the flow of saliva. The quantity of each substance used in making the test was in each case one ounce. The food, whether solid or fluid, was taken into the mouth in small portions and chewed for a few seconds, then, being ejected from the mouth, it was received into a small vessel for weighing. The length of the experiment with each substance was exactly five minutes. The difference in weight between the substance before chewing and after represents the amount of saliva which had been added to it during mastication.

One ounce of wheat flakes increased in weight 59.79 grams.

One ounce of wheat flakes with two grams of common salt increased in weight 58.8 grams.

One ounce of wheat flakes sprinkled with pepper increased in weight 59.1 grams.

One ounce of wheat flakes with five c.c. of strong cider vinegar increased in weight 55.9 grams.

One ounce of moist bread increased in weight 31.1 grams.

One ounce of raw apples increased in weight 38.1 grams.

One ounce of water increased in weight 2.92 grams.

One ounce of milk increased in weight 3.82 grams.

One ounce of pea soup increased in weight 5.82 grams.

Paraffin chewed for five minutes produced 20 c.c. of saliva.

These results clearly indicate that dryness is the property which stimulates the flow of saliva more than any other. An ounce of dried wheat flakes increased in weight two ounces or 200 per cent. The addition of salt, pepper or vinegar to the wheat flakes did not increase the flow of saliva. The weight of moist bread was increased half as much, whereas, the weight of water, milk, and soup increased only ten to twenty per cent. I called attention to these facts in a paper before the Michigan State Dental Association at its meeting in 1897.

The results obtained by Pawlow by his classical experiments on dogs published a few years ago, clearly demonstrates the same fact. A marble placed in the mouth of the dog produced little or no flow of saliva, but when the same marble was crushed to a powder and placed in the dog's mouth an abundant flow of saliva occurred.

Pickerill insists that the saliva is a natural and potentially perfect mouth wash superior to all dentifrices. This is doubtless true when, instead of being a product of contaminated blood, it is well supplied with germ-destroying and germ-inhibiting enzymes and opsonins from healthy blood.

Our modern diet affords little opportunity for efficient exercising of the chewing mechanism, as little food is taken in a dry state and almost nothing is ever eaten which is hard enough to demand full action of the jaw muscles, except by an occasional encounter with a particularly tough steak or chop. Even then the amount of chewing is reduced to a minimum, broken up by the gastric juice without the aid of mastication. Carniverous animals do not masticate.

Fisher found in his experiments on the effects of thorough mastication of food that his subjects without exception greatly diminished the amount of meat eaten and in most instances gave up the eating of meat altogether.

The dog bolts his meat but exercises his teeth in eating bones, which should always be eaten with meat in order to furnish the necessary supply of lime.

When a pig or an ox eats corn and grass the lime content of the animal's food is almost wholly deposited in the bones. Only one-half of one per cent. remains in the soft parts. When the ox or pig is eaten by the man he eats only the soft part and hence only gets back about one two-hundredth part of the lime contained in the original food.

All flesh-eating animals eat bones. Man must do the same if he makes meat a large constituent of his dietary or else he must suffer from lime starvation.

The scouring properties of food are chiefly due to cellulose and organic acids. It was interesting to note that in the experiments referred to above the abundant flow of saliva produced by the chewing of an apple showed an increase of nearly one hundred and forty per cent.

This indicates that the apple is a highly valuable dentifrice and not only supplies the disinfecting acid, but promotes an abundant flow of saliva rich in protective and digestive enzymes.

Deficient chewing of the food, by diminishing the work of the muscles which move the jaws, lessens the blood supply of the teeth and so diminishes their power of resistance to invading micro-organisms.

Dr. G. V. Black several years ago demonstrated, by means of a special instrument which he called a gnatho-dynamometer, that when properly used the muscles of mastication are capable of exerting a surprising amount of force. In one thousand persons the average force of the bite in pounds of pressure was found to be 171 pounds. The variation was from a minimum of twenty-five pounds to a maximum of 275 pounds. Seventeen persons in one thousand were able to meet a maximum. In persons who are accustomed to swallow their food with little mastication the force of the bite was found to be only fifty pounds or even less.

Black found that neglect to use the teeth forcibly by the chewing of hard substances gave rise to changes in the peridental membrane, rendering it sensitive and less resisting.

That our ancestors made good use of their teeth is shown not only by the large and well-preserved teeth of our nearest relatives in the animal kingdom, the orang-outang, the chimpanzee or the gorilla, but in the fossil remains of prehistoric man.

The following table which I have compiled from the works of Keating and other authorities on food analysis shows the amount of cellulose contained in different classes of ordinary foodstuffs.

VEGETABLES	Number Cellulose grains in one ounce
Peas (dried)	28.5
Green peas	9.35
Cabbage	9.2
Parsnips	8.65
Kohl-rabi (raw)	7.75
Brussels sprouts	7.85
Celery (raw)	7.
Turnip	6.6
Pumpkin	6.1
Potato (baked)	5.45
Beet	5.25
Asparagus	5.2
Carrot (raw)	4.9
Spinach	4.65
Cauliflower (steamed)	4.55
Tomatoes	4.20
Beans, string	4.
Cucumber (raw)	3.9
Lettuce	3.65
Onions	3.55

FRUITS	Number Cellulose grains in one ounce
Huckelberries	61.
Raspberries	37.
Blackberries	25.
Cranberries	25.
Currants	23.
Figs	22.5
Gooseberries (stewed)	17.5
Pears	15.
Apricots	12.5
Prunes (cooked)	10.
Cherries	10.
Oranges	10.
Strawberries	10.
Raisins	8.5
Grapes	7.5
Plums	7.5
Apples	5.
Peaches	5.
Bananas	1.5

CEREALS	
Sterilized bran	200.
Oatmeal (cooked)	50.
Peas (dried)	28.5
Lentils	20.
Rye (meal)	15.
Wheat (cooked)	10.
Rolled wheat (cracked)	10.
Graham flour	10.
Granola (cooked)	10.
Corn meal	10.
Corn flakes	10.
Graham bread	6.
Whole wheat bread	5.
Wheat grits (cooked)	5.
Beans (dried)	40.
Unpolished rice	3.75
Polished rice	2.
Fine flour	1.5

By referring to such a table it is easy by the use of bran to prepare a dietary containing the needed amount of cellulose. A very convenient way of using bran is to add sterilized bran to oatmeal, cream of wheat, pancake flour and other cereals in the proportion of one part of bran to three parts of other meal. Sterilized bran may also be added in about the same proportion to rice, mashed potatoes and other vegetable purees. It may be added to flour in the making of bread, biscuit, etc. It is necessary that the bran should be clean and sterilized or cooked.

Another thing important for the health of the teeth is the free use of uncooked foodstuffs such as lettuce, cucumbers, celery, cabbage, tomatoes, and fresh fruits of various sorts. It has been demonstrated within recent years that scurvy, a disease which to a marked degree affects the teeth and gums, is the result of the long continued use of cooked foods. It has been shown that certain subtle but essential elements of the food, called vitamines, are in large part destroyed by cooking. These substances are chiefly found in the envelopes of foods and it is for this reason that an exclusive use of polished rice gives rise to beri-beri. The exclusive use of fine flour produces the same disease in pigeons and other small animals. Many people live so exclusively upon cooked foodstuffs that they almost entirely deprive them selves of the vitalizing influence of the subtle harmones which nature provides in natural foodstuffs. Though in so small a quantity as to seem almost insignificant, vitamines nevertheless supply a highly important part as activators of the numberless ferments which operate in the body not only in the digesting of food but in every phase of metabolic activity.

No farmer would think of feeding his stock on exclusively cooked food. Part of every meal should consist of something fresh from the orchard or the garden. In cold countries like Russia and North Germany, this universal need is largely supplied by sauerkraut, which at once supplies the needed lime, cellulose and vitamines. The peasants of China and Japan find the same advantage in the use of dried turnips and other fruits and vegetables. It is possible in this country to obtain at all seasons of the year good supplies of fresh foodstuffs and the public should be educated to an appreciation of the importance of using these foodstuffs not merely as table decorations or as luxuries, but as a necessity for the maintenance of bodily health and vigor.

While one must deprecate the vagaries of the raw food faddists, it cannot be denied that great and widespread injury results from the too exclusive use of cooked food. One cause of this is the extensive introduction of canned foods, which, in order to insure keeping, are cooked at a temperature much higher than the ordinary cooking temperature. These foods are usually cooked at about 240 degrees, a temperature which destroys all the vitamines, while the ordinary cooking temperature, 210 degrees, especially in the case of such vegetables as the potato, leaves the vitamines in large part intact. The vitamines of cereals can be more readily damaged by cooking, hence the advantages of the Scotch method of cooking oatmeal. The meal is simply stirred into boiling water, allowed to simmer for five or six minutes and then served. This method cooks the grain sufficiently to render it palatable, while at the same time preserving the vitamines intact. This slight cooking also leaves both the protein and the lime in better condition for absorption while long cooking renders lime salts insoluble, as shown by Cronheim and Mueller, in a study of boiled milk.

Another advantage in the use of oatmeal cooked in the manner described and of very great importance, consists in the fact that a portion of the starch remains uncooked, and being more slowly digested, finds its way into the colon and supplies in the lower intestine the carbohydrate necessary to support the growth of acid-forming organisms, and thus effectively combats intestinal toxemia.

The observations of Metchnikoff, Tissier, Distaso, Kendall and other famous bacteriologists who have made a special study of the intestinal flora, have shown the importance of supplying the colon with carbohydrates as a most effective means of encouraging growth of protective flora. I have observed the practical benefits of the application of this principle in many hundreds of cases and believe it to be one of the most important means of combating the widespread mischief arising from the activity or formation of the proteolytic organisms in the lower intestine.

My paper has already extended to a much greater length than I intended, and I must close, though aware of the fact that I have presented the subject of dietetics in relation to mouth infection in a very inadequate way. I hope, however that some of the points which I have presented will be deemed worthy of consideration and will bear the test of clinical experience.

Who Said It?

If a man can write a better book, preach a better sermon, or make a better mouse-trap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door —*Emerson*.

Dr. Horace Warren, of Missouri Valley, Ia., states that Emerson is not responsible for the above, so often credited to that distinguished individual. Can you prove that Emerson did produce it?—*Nebraska Dental Journal*.

No, Emerson did not write it; neither did Elbert Hubbard, although it has been claimed for both. Some years ago I undertook to find out who did write it, and wrote to both the Emerson executors and Fra Elbertus. Replies from both were negative. Since that time I have seen the quotation claimed for the Fra, not only by various publications, but by Mr. Hubbard's press agent. *Quien sabe?*

—G. E. H.

ROOT CANAL FILLING*

BY DR. W. C. HESSLER, CRAWFORDSVILLE, INDIANA

THIS METHOD IS AFTER THAT ADVOCATED BY DR. CALLAHAN

The cavity is clean, and we begin with the drying of the root canal. I generally use a little alcohol and sometimes absolute alcohol. Use the chip blower and fan warm air into the cavity until it is perfectly dry. You have the cavity dry, but not the root canal. Insert a little alcohol into the root canal and again fan it out. Now use absorbent paper points and insert them until no moisture can be detected on the points of the same. Fan the cavity and canals some more and use Evan's root canal dryer. Get canal as dry as possible because we expect to carry the sealing material by capillary attraction or diffusion.

At the end of the root we often find a deltoid condition, where the root canal separates into two or three little auxiliary foramina besides the main canal. As we cannot get all the organic substance out of these little canals, we will at least try to remove the water of composition. Take a fine broach with a few fibers of cotton wound round it and pump the rosin solution into each canal (12 grains of rosin to 3 drams of chloroform). The best rosin is that which is specially prepared for the violin bow. Pump the rosin-chloroform solution into each canal not only once but continue pumping, forty, fifty or sixty times into each canal, because as you pass the broach and cotton into the canal some of the solution will be raked off on the walls of the canals.

Now apply some eucapercha compound to canal or canals and insert a Canfield gutta percha point or any sterile gutta percha point.

A hint: It is desirable to ream out a small or tortuous canal. I prefer using the reamer in the right angle hand-piece. Guide the point of the reamer to the mouth of the canal. Apply very little pressure to the instrument.

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*Clinic at the Indiana State Dental Association, 1915.

THE EMETINE TREATMENT FOR PYORRHEA

BY DR. J. V. STARKS

Emetine for the treatment may be applied either locally or systemically; locally, one-half per cent. solution of emetine is injected into each pyorrhea pocket and repeated on five successive days. For systemic treatment, one-half grain emetine hydrochlorid daily for four or five days, or give alcresto ipecac tablets, six tablets a day for six days.

Demonstration of the endomœba under the microscope, constant specimens, motile endomœbas; getting the specimens from the mouths of the dentists and their patients.

THE USE OF SYNTHETIC PORCELAIN*

BY DR. F. J. PROW, BLOOMINGTON, INDIANA

Synthetic porcelain, as you all know, has revolutionized dentistry from the esthetic standpoint. The cavity preparation here is similar to all other forms of preparation, except that the margins should be more angular; not, however, frail or unsupported. General retentive forms should be made. The material should be dragged into the liquid with as little spatulation as possible, and it should be used just at a time when it fails to string after the spatula. Place it as quickly as possible in the cavity, and pack or pull it into proper form quickly. The surface of the filling must be protected from moisture and air for a period of from ten to twenty minutes, which may be done with cocoa butter of the ethereal preparation furnished by the manufacturer. The filling may be finished after ten or twenty minutes.

Contrary to the usual custom, I use this material in bicuspids and molars, and I haven't up to this time found any more failures used in this position than I do in the anterior teeth. In such positions this material should have no thin margins or frail corners. If this technic is observed I find it very serviceable in these teeth. I do this always looking to the question of permanency, and of course it must be used with intelligence and judgment, and the utmost care as to technic. I have built up a full half of a bicuspid in this way, and after a year and a half of service it is perfect. I put in recently four molars, of which two-thirds of the occlusal surface was involved. Three years ago I put in an inferior central incisor involving three-fourths of the incisal edge and two-thirds of the proximal surface, relieving the incisal edge from the stress of mastication slightly, and it isn't changed in any degree after the expiration of that length of time.

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*Clinic at Indiana State Dental Association, 1915.

A tool or instrument that will hold its edge well under hard service is worth so much more than one which will not, that there is not much room for comparison in the matter of price and preference.

HEALTH CONSERVATION

A HEALTHY CITIZENSHIP THE STATE'S BEST ASSET*

BY JAMES M. COX, COLUMBUS, OHIO

EX-GOVERNOR OF THE STATE OF OHIO

THE GOVERNOR OF THIS STATE ordinarily finds in meeting the various conventions that he is called upon to meet, that the organizations under whose auspices he appears are extremely gracious in this, that they always find for him a subject, and in my own experience they give it to him when he lands on the stage the evening the speech is to be made. So I congratulate this organization upon living true to precedent in the state. It is a pleasant duty, however, to come here. It is a pleasure, in the first instance, to come into your presence and join in this symposium intended for the betterment of conditions within the state. There is a satisfaction in knowing that you are associating with those of a certain fixed mental attitude with reference to the importance of health conditions in this state. It is a pleasant duty, as I said, because, as I conceive it, this state is honored by the chief executive participating in conventions such as these.

I spoke a moment ago of precedent. If there is anything that you men, as members of a great profession and as individual citizens in your communities, should declare unrelenting warfare on, it is precedent; it is the dogmatism of custom that makes your going harder than it would otherwise be. It has come to be a popular thing to speak flippantly now of any science. You will occasion a laugh in a country grocery store, in any social company ordinarily, if you will make a flippant or frivolous remark with reference to the ideals that are dominating the profession of dentistry in this state, or the standards that the medical profession is seeking to reach, to chin up to, if you will permit that popular figure of speech. Five years ago, when it was suggested that the condition should be imposed in all schools that the child should be healthy in the forms of its teeth, that occasioned many a frivolous observation. Right now in Ohio the police power of this state is being exercised to stamp out foot and mouth disease. We have had a good deal of mouth disease in Ohio for years, and no one seemed to worry much about it. Nevertheless, the police power of the state is exercised now in the manner I have indicated. If you had a half dozen epidemics scattered, without regard to community conditions, throughout this state, the chances are you would find one or two of those communities with an absolutely depleted health fund, and not a dollar available to protect the public health in that part of the state.

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*An address before the Ohio State Dental Society, 1914.

We pass laws in Ohio, we administer them and put them into effect, in which we recognize the importance of carefulness and of scientific methods in the breeding of stock. We do not permit a sire of the horse or cow to come into the state until he is declared perfectly sound; and yet, on Thursday night this state takes a human life in the Ohio penitentiary because society has been extremely negligent. There reposes tonight in the annex of the Ohio penitentiary a young fellow with a mental growth of about ten, eleven or twelve years. When he went in there you would have thought that he would have been an extremely unhappy young fellow; but he wasn't. He said to the warden: "I am happier than I have ever been before." "Why?" "This is the only home I have ever had. My parents died before I knew the meaning of the word. Warden, I have never been treated kindly until now, and whether I stay here for life, or stay here until the day fixed by law, I am glad to have come; I have been treated here with kindness."

Now, the truth is that society is responsible in considerable part for the unhappy predicament of that young fellow tonight in the annex at the Ohio penitentiary, because the history of the case shows that the father was too mentally weak to have received a license to wed.

Captain Hastings of the Boys' Industrial School at Lancaster says that in twenty per cent. of the instances of the consignments of youths to that institution, the boy has been improperly fed and nourished. Ninety-five per cent. of every instance of crime that comes under our eye for analysis at the Ohio penitentiary is due to circumstances of birth or environment, or of the domestic conditions in which the young chap is plunged.

I sat, three months ago, in the presence of almost two thousand convicts, with Miss Maud Ballington Booth, than whom there is no greater human force for good in the world. I said to her, "How can this crop be reduced?" She replied, "We must not only think of a means of improving the unfortunates in prison; we must not only give thought to the communities to which these men and women are compelled, many of them, ultimately to return, but we must analyze the cross-currents of life from which they came and the social disorders which there exist."

I contend, therefore, that we should all dedicate ourselves to the task of standing behind professions such as yours, and the medical profession as well, in your effort to raise standards and ideals.

I congratulate the dental profession in this state upon having brought about, by the mere stress of your devotion to better ideals, the recognition of the state government and the placement of a dentist on the Board of Health in Ohio. And I congratulate you, members of the dental profession, upon having a man in this city, the capital, who thinks and dreams of nothing except dentistry. The Lord implanted the microbe of dental enthusiasm deeply into the impressions of Doctor Brown, and your profession has profited by it as a result.

Our citizenship owes you co-operation. Doctor Thompson has made the observation as to the requirements that should be imposed upon those desiring to enter college. I have no doubt he speaks from a long experience and yet we have many letters at the State House from young men who want to enter the dental profession, who have never had a chance to meet these requirements. It seems to me, Doctor Thompson, that it might be well to work to that by easy stages, for you will admit that while we have had in Ohio great universities, we haven't paid enough attention to our common schools, and particularly our rural schools, and when you impose arbitrarily now too high an entrance standard, you may close the doors to many a boy and girl in the rural communities who has never until now, with the dawn of better things educationally in Ohio, had such opportunities as others have had in the state.

I say, let us dedicate our efforts, one and all, standing behind these two great professions that are giving so much attention to the betterment of conditions within this commonwealth, fighting precedent and custom and fetich—I am just a little bit careful of my pronunciations in the presence of a college professor. How do you pronounce that word, Mr. Thompson? Maybe it is a good deal like *medulla oblongata* and "medulla oblongotta." It has been my observation that we, in Ohio, are just a little too prone, when we do get down to a real consideration of health conditions, to be led away by the hysteria of a religious frenzy and a booze fight. It is amazing how easily the average citizen is diverted from the really vital question of health and humanitarian laws.

I shall soon be a private citizen, and I am proud to enter the ranks. There are many more private citizens than governors in Ohio, and I don't know but that I am in better company at that. But I came into public office with the old-fashioned notion that promissory notes are to be paid, and they were paid 100 cents on the dollar. If payment had only been made at eighty cents on the dollar, I would be over in the stone house two years more, with the office but not with my self respect, and I prefer the latter. I am very proud to face the gentlemen of this profession without a defense or an apology. I have sought as best I could to promote the things you have striven for for years. We procured the passage of many health measures, but not as many as we would like to have brought about, but some progress has been made, and thank the Lord for that.

As a private citizen I offer here in this presence my co-operation. I recognize your troubles, ideals, hopes, aims and aspirations, and I am with you tonight, as I was two years ago, and may God bless you in your great work.

OBITUARY

Dr. Greene Vardiman Black

In the death of Dr. G. V. Black, the dental profession loses one of its most prominent members and a scientist of note.

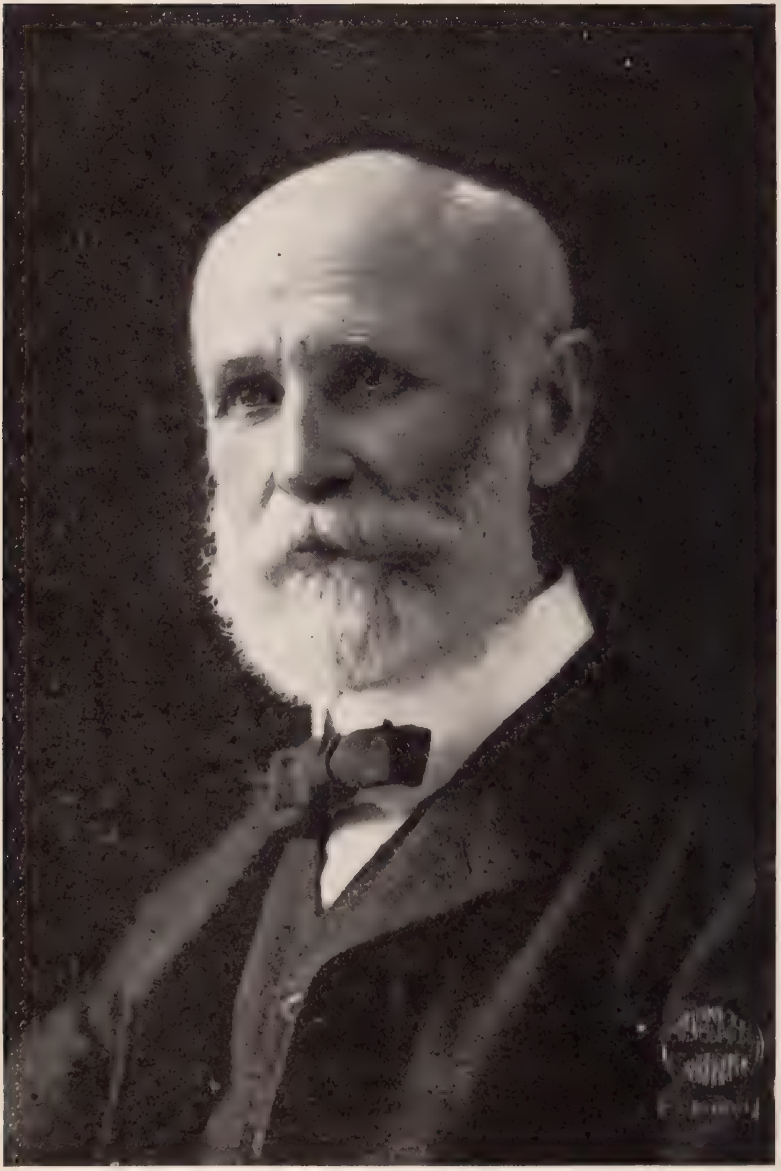
Doctor Black died at Walnut Lodge, Cass County, Illinois, his boyhood home, on Tuesday, August 31, 1915. His death was due to pernicious anemia, with which he had been afflicted for some time.

His long and useful life covered a period of seventy-nine years, and for more than half a century he devoted practically his entire thought and energy to the development of the scientific and practical problems of dentistry.

He was born in Scott County, Illinois, near Winchester, August 3, 1836. He was the son of William and Mary Black, and a great-grandson of Capt. William Black, an officer of the militia in North Carolina just before the Mecklenburg rebellion, and one of the first officers to refuse to take the oath of allegiance to the British crown. The father of Dr. G. V. Black was born in Milledgeville, Ga., in 1796. In 1825 he went to Tennessee and there was married to Miss S. Vaughn, removing to Scott county in this state about nine years later. After residing for ten years in Scott County, in which period the subject of this sketch was born, the family removed to Cass County, settling seven miles southeast of Virginia, on the farm that has ever since been associated with the family name and where Dr. G. V. Black passed the last few years of his life.

The boyhood of the deceased was passed on his farm in Cass County, and it was always a dear spot to him. Many of his summers were spent there during his long professional career. Last year he was there for several weeks and it was with great reluctance that he left in the fall for his home in Chicago.

At the age of 16 Doctor Black left the farm for a time and made his home with his brother, Dr. T. G. Black, of Clayton, Ill. With him he read medicine and for a time served as postmaster of the village. At the age of 21 he began the study of dentistry with Dr. J. C. Speer, of Mt. Sterling. Afterward he established a dental office in Winchester, where he remained in the practice of his profession until 1862. In 1860 Doctor Black was married to Jane L. Coughennower, who died August 26, 1863. In 1865 he was married to Miss Elizabeth Akers Davenport, who survives him, together with the following sons and daughters: Dr. Carl E. Black, of Jacksonville, Miss Clara Black, of Chicago, Dr. Arthur D. Black, of Chicago, and Mrs. Mark Baldwin, Duluth, Minn.



Greene Vardiman Black, M.D., D.D.S., Sc.D., LL.D.

Doctor Black served in the Union army during the civil war with the rank of sergeant and was engaged most of his time on special scouting duty. He received an injury to one of his knee-joints while in the service, which kept him for six months in a hospital in Louisville, Ky.

In 1864 Doctor Black opened a dental office in Jacksonville, Ill., and at first applied himself to the study of chemistry, establishing a complete working laboratory in connection with his dental office. He organized a class in chemistry among the public school teachers of the city, which he taught several years. He also took a prominent part in the medical organizations of the city and county.

Doctor Black, even in the earlier years of his professional career, became known as an author and lecturer on scientific topics pertaining to dentistry. Since then he has become world-renowned and his writings have been translated into many languages and are standard authorities on the subjects they discuss. A prominent feature of all of Doctor Black's writings are the numerous original drawings they contain.

In recognition of his distinguished services to the dental profession a banquet was given in Doctor Black's honor January 29, 1910, in the gold room of the Congress Hotel, in Chicago, by the Chicago Dental Society. At this assemblage four hundred representatives were present from Canada, Europe, South America, Australia and every part of the United States to do him honor.

In experimental work, in invention, as the author of hundreds of pamphlets and books, Doctor Black truly can be said to have accomplished more for dental science than any other one man. At the banquet in 1910 the guest of honor was called upon last, and in a characteristic, modest way, framed his thanks briefly to the men who had gathered to do him honor. In closing he gave expression to the chief thought that was in his mind when he said that he did not have a goodbye for his friends, but rather a goodnight. He said though he had passed the mark of three score and ten, that he did not believe that his work was over—that there were many things in his mind that ought to be done and that he hoped he might be able to do them. "I love the work I have been doing and I am not ready to quit." And so it was given to him even in the years following that night to accomplish still other great things for the profession to which he had unsacrificingly given the best years of his life.

In addition to his work as a writer and teacher, Doctor Black was an inventor, and it was he who designed and patented one of the first cord transmission dental engines. The present methods of preparing cavities in teeth, and the methods of making and inserting gold and amalgam fillings largely resulted from his investigations. For more than a quarter of a century he has stood pre-eminent as an original worker and his name is known among dental and medical men the world over. For a period of ten years ending in 1880 he lectured on pathology, both general and dental, in the Missouri Dental College in St. Louis. Subsequently from 1886 to

1889 he lectured in the Chicago College of Dental Surgery; then he became identified with the dental department of the University of Iowa, from which position he was called to Northwestern University, and was made the dean of the dental department in 1897.

Doctor Black was the first president of the State Board of Dental Examiners in Illinois; served as president of the Illinois Dental Society and the American Dental Association, and for a long period of years represented Northwestern University in the American Association of Dental Faculties. He was president of the section on pathology of the International Dental Congress during the World's Fair in St. Louis; also of the Panama-Pacific Congress.

He was awarded the first gold medal by the dental society of the state of New York for scientific research and also the first Miller prize, the latter being a gold medal voted by the International Dental Federation for the most valuable contributions to the literature and scientific advancement of the profession. Dr. F. Aguillar, of Madrid, was commissioned to come to Chicago to make the presentation in person.

Doctor Black was so wrapped up in his work, so intent on the great things that he was accomplishing, that he had no thought of material gain or personal aggrandizement. His purpose was to solve unsolved problems in science, to perfect methods and apparatus, and to develop theories that they should become practical aids to the dental profession and thus to humanity. His work was for all men, and with singular self-forgetfulness he gave unsparingly of his time and his great mentality for the world at large. While his work was such that he came to be a recognized dental authority the world over, his simple habits of life and the kindly approachableness of his manner never changed.

The stories of his deep and unassumed interest in young and struggling practitioners are many, and he had that quality of heart gentleness that marks many men who are really great. His long life has closed; he has not lived in vain, and no monument could be erected in his memory which could give half the glory to his name that will come through the years from the recollection of his work. The mere statement that he contributed largely to the text books and literature of dentistry conveys little idea of how large his contributions have been in this line. A list of pamphlets and books from his pen was compiled several years ago and occupies twenty pamphlet pages. He began writing in 1866 and from that time dental treatises came steadily from his pen, his activity in this line continuing until but a few months ago.

The following are the leading events of the life and professional career of Dr. Greene Vardiman Black as compiled several years ago:

Born near Winchester, Scott County, Illinois, August 3, 1836.

Family moved to farm seven miles southeast of Virginia, in Cass County, Illinois, in 1845.

Attended country school about three months each winter.

Studied medicine with Dr. Thomas G. Black, a brother, at Clayton, Ill., 1853-1856.

Studied dentistry with Dr. J. C. Speer, Mt. Sterling, Ill., 1857.

Practiced dentistry at Winchester, Ill., 1858-1862.

Enlisted in 129th Illinois Volunteers, 1862.

In hospital at Louisville, Ky., six months, and discharged for disability, 1863.

Practiced dentistry in Jacksonville, Ill., 1864-1870.

Joined Missouri Dental Society, 1866.

Joined Illinois State Dental Society, 1868.

First important dental paper on "Gold Foil," read before Illinois State Dental Society, 1869.

President Illinois State Dental Society, 1870-1871.

Invented one of the first cord-driven, foot-power dental engines, 1870.

Lectured on pathology, histology and operative dentistry, Missouri Dental College, 1870-1880.

First president of the Illinois State Board of Dental Examiners 1881-1887.

Wrote book, "The Formation of Poisons of Micro-Organisms," 1884.

Professor of Dental Pathology, Chicago College of Dental Surgery, 1883-1889.

Introduced teaching of dental technics, Chicago College of Dental Surgery, 1887.

Wrote for the American System of Dentistry, chapters on "General Pathology," "Dental Caries," "Pathology of Dental Pulp," and "Diseases of the Peridental Membrane," 1886.

Wrote book, "Periosteum and Peridental Membrane," 1887.

Voted life membership in Illinois State Dental Society, 1889.

Professor Dental Pathology and Bacteriology, dental department, University of Iowa, 1890-91.

Wrote book, "Descriptive Anatomy of the Human Teeth," 1891.

Wrote series of articles entitled, "The Management of Enamel Margins," *Dental Cosmos*, 1891.

Professor Dental Pathology and Bacteriology, Northwestern University Dental School, 1891-97.

Chairman of section on Etiology, Pathology and Bacteriology, World's Columbian Dental Congress, 1893.

Report on Dental Nomenclature, World's Columbian Dental Congress, 1893.

Wrote series of articles entitled "An Investigation of the Physical Characters of the Human Teeth in Relation to Their Diseases and to Practical Dental Operations, Together with the Physical Characters of Filling Materials," *Dental Cosmos*, 1895-96.

Dean and professor of Operative Dentistry, Dental Pathology and Bacteriology, Northwestern University Dental School, 1897, to the time of his death.

President National Dental Association, 1900.

Awarded First Fellowship medal, by the Dental Society of the State of New York, 1905.

Special guest at annual meeting of American Dental Society of Europe, 1906.

Wrote work on "Operative Dentistry," in two volumes, 1908.

Voted Miller prize for most valuable contributions to dental science and literature by the International Dental Federation, 1910.

Wrote book on "Special Dental Pathology," 1915.

Francis Marion Burkett

Francis Marion Burkett, son of Samuel and Hannah Burkett, was born in Hagerstown, Ind., March 30, 1849, and passed away August 14, 1915, at his cottage at Pretty Lake, near Plymouth, in the 67th year of his age. With his parents he removed from Hagerstown to Palestine, Ind., thence to Warsaw, Ind., where his boyhood and early manhood was passed. In the sixteenth year he enlisted in Company E, One Hundred and Thirty-eighth Indiana Infantry, in which he served until the close of the Civil War.

"Marion" Burkett, as he was known among his acquaintances, was a man of sterling character. Starting early in life in the dental profession practicing a short time at Warsaw, he opened an office in Rochester, where he remained for about ten years. Thence he came to Plymouth in 1876 and opened an office. By dint of hard labor and close application in the line of his profession he accumulated a competence and for the last year or so he had been gradually withdrawing from active practice, having taken into partnership his son, Dr. Clifford Burkett.

Of a kind and generous disposition, he was never known to turn a deaf ear to the call of those in need or distress. He stood high in the dental profession and was a man possessing the high esteem of all his acquaintances.

Of the civic organization of Plymouth, Doctor Burkett was a member of the G. A. R., the Masonic lodge, and the Commercial Club. He served on the school board of Plymouth, Ind., for four years.

He is survived by his wife and two children, Dr. Clifford Burkett, of Plymouth, and Mrs. Harry Alexander, of Dayton, Ohio; also two brothers, Dr. C. W. Burkett, of Warsaw; Charles H. Burkett, of Evanston, Ill.; and one sister, Mrs. Charles Wharton, of Denver, Colo.

The following resolutions were adopted at a meeting of the Marshall County Dental Society, held in Plymouth, Ind., Monday, August 16, 1915:

Having learned with sorrow of the sudden death of Dr. Francis Marion Burkett, and desiring to place on record our appreciation of his worth as a citizen and an honored member of the dental profession, we offer the following:

For nearly fifty years Doctor Burkett has been an active practitioner of dentistry in Marshall County, and has always stood for the highest ideals of his profession.

His unfailing courtesy to the members of his profession has been most marked and the memory of his example and wise counsel will be long cherished in the minds of his associates.

Doctor Burkett had been for years a member of the Indiana State and the Northern Indiana Dental Societies, and at the formation of The Marshall County Dental Society was unanimously elected its first president, holding that position at the time of his death.

In the death of Doctor Burkett, the dental profession of Indiana has lost one of its foremost members and the members of this society a wise counselor and a true friend.

Resolved, That this resolution be spread upon our records and copies sent to the family of Doctor Burkett, and given to the press.

SOCIETY ANNOUNCEMENTS

The Florida State Dental Society

At the last meeting of the Florida State Dental Society, held at Pass-a-Grille, Florida, in June, the following officers were elected for the ensuing year: A. M. Jackson, Lakeland, president; J. L. Williams, Jacksonville, first vice-president; C. J. Caraballo, Tampa, second vice-president; D. D. Crews, Fort Meyers, recording secretary; M. C. Izlar, Ocala, corresponding secretary; F. S. Robinson, Jacksonville, treasurer. Executive committee: C. L. Nance, Tampa, chairman; W. K. Bradfield, St. Petersburg; J. R. Lynn, Fernandina; G. A. Brummett, Fort Myers; H. L. Chilson, Bradentown.

It was decided that the meeting for 1916 should be held in Orlando, Florida, beginning on the third Wednesday in June.

Rhode Island Board of Registration

The Rhode Island State Board of Registration in Dentistry will hold its regular meeting for the examination of candidates at the State House, Providence, R. I., on November 9, 10 and 11, 1915.

Only candidates holding a degree from a recognized college are admitted to this examination.

Each candidate must present in person his degree to the secretary of the Board.

William B. Rogers, *Secretary*,
171 Westminster street. Providence, R. I.

Pennsylvania State Board

The next regular meeting of the Pennsylvania Board of Dental Examiners for the examination of applicants who desire to register in this state, will be held in Musical Fund Hall, Philadelphia, and the University of Pittsburgh, on Wednesday, Thursday, Friday and Saturday, December 15, 16, 17 and 18, 1915. Application blanks can be secured from the Department of Public Instruction, Harrisburg.

The Board desires to call attention to the resolution adopted recently by the Dental Council requiring that matriculates in a dental college in 1915 shall have the equivalent of a four-years' high school diploma at the time of their matriculation, in order to be eligible for examination by the Pennsylvania Board.

The dental law passed by the last session of the Pennsylvania legislature makes it necessary for every dentist engaged in the practice of dentistry in this state to register with the secretary of the Board of Dental Examiners before January 1st, 1916, and annually thereafter, at one dollar per year. Blanks are being prepared and will be sent as soon as possible. Anyone not receiving the blanks can secure them from the secretary.

Alexander H. Reynolds, *Secretary*

4630 Chester Ave., Philadelphia, Pa.

Preparatory Course

The California State Board Examination will be held in San Francisco in December, 1915. Any dentist who contemplates taking this examination and feels the need of a preparatory course, may attend such a course which will be conducted in Los Angeles by Dr. Endelman commencing November 1st.

Further information may be obtained by addressing Dr. Endelman in care of The Jas. W. Edwards Co., Los Angeles, Cal.

Ohio State Dental Society

The Semi-Centennial anniversary of Ohio State Dental Society, December 7, 8, 9, 10, 1915, at Columbus. Four-day session.

Unveiling of the Miller Memorial. Don't forget.

Indiana State Board

The next meeting of the Indiana State Board of Dental Examiners will be held at the State House, Indianapolis, commencing November 8th and continuing five or six days.

For application blanks and full particulars address Dr. Fred J. Prow, Secretary, Bloomington, Indiana.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

The National Dental Association will meet in New York City in 1917.

National Examiners Elect

San Francisco, Aug. 21.—New officers were elected today at the closing session of the National Association of Dental Examiners, meeting in conjunction with the Panama-Pacific Dental Congress.

Officers elected were: President, C. M. McCauley, Texas; vice-presidents, East, H. A. Reynolds, Philadelphia; West, J. A. Dalrymple, Salt Lake City; South, R. A. Walsh, Lexington, Ky.

The Panama-Pacific Congress

San Francisco, Sept. 8.—The Panama-Pacific Dental Congress adjourned here today after adopting a resolution indorsing all the federal legislation proposed by the National Dental Society for the improvement of dental work in the army. Dr. Frank L. Platt, of San Francisco, president of the congress, said that the meeting of dentists had accomplished more than was hoped for and that it was so financially successful that dividends would be paid on the stock sold to finance the congress.

Illinois Board Criticised

San Francisco, Aug. 31.—Methods of the Illinois State Board of Dental Examiners were criticised today at the closing session of the National Association of Dental Examiners in the resolutions adopted.

"In view of the irregularities that have existed in the conducting of examinations by the Illinois State Board of Examiners during the last two years," the resolutions said, "it is the opinion of the National Association of Dental Examiners that it is to the detriment of the profession of dentistry where appointments to the state board are made without the indorsement of the state dental society, and it is further resolved that the association refuse to accept any recommendations under reciprocity agreements from the Illinois Board as at present constituted."

All dental and medical colleges report serious overcrowding and the attendance may have to be limited.

Ohio Delegates

Twenty Ohio dentists were appointed by Gov. Willis to represent Ohio at the International Dental Congress, held at San Francisco, August 29. The delegates were: Drs. H. C. Brown, Gillete Hayden and J. M. Henderson, of Columbus; W. A. Price, G. H. Wilson and W. C. Teeter, Cleveland; J. R. Callahan, Cincinnati; L. E. Custar, Dayton; C. I. Kealy, Hamilton; A. E. Bibble, Urbana; W. H. Munger, Piqua; A. P. Linscott, Marion; R. H. Vollmayer, Toledo; J. R. Owen, Cleveland; C. W. Hamm, Chillicothe; F. L. Foust, Lima; C. S. Rott, Springfield; J. L. Goetz. Wapakoneta, and Charles Brecheisan, Ada,

The Oldest Printer-Dentist

EDITOR THE DENTAL SUMMARY:

Doctor Beardman, of Boston, writes me of reading my paper in the SUMMARY. However, I have not seen it yet.

The Old Printers' Association entertained me as one of the oldest printers living—in fact, the oldest, as I was setting type in a Boston office in 1841—74 years ago.

I told them I appeared in a double role, that of printer and dentist, and that I never knew of another dentist graduating from a printing office, and that I was proud of my Alma Mater, as it helped me to fill another role, that of a writer, all these years, not only for dental journals but also for newspapers on a variety of subjects.

Yours truly,
L. P. HASKELL

Chicago, Ill.

No matter how thick your rubber heels, they won't stop your courage skidding if you don't use plenty of mental grit when things get slippery

Send For A Copy

Readers of THE DENTAL SUMMARY who are interested in school clinic work and the oral hygiene propaganda in general, will do well to write to A. C. Fones, D.D.S., chairman dental committee of the Board of Health, Bridgeport, Conn., and ask for a copy of the First Annual Report of that committee. From this report we make the following excerpts:

The dental corps working in the schools comprised eight women prophylactic operators and two women supervisors. The latter part of the second week in April a ninth woman operator was added to the number.

The total number of individual children given prophylactic treatments was 6,768. The number given one treatment was 1,872; the number given two treatments, 2,116, and the number given three or more treatments, 2,780. The total number of prophylactic treatments given was 14,340.

The supervisors gave tooth brush drills from October to June 20th, to 12,546 children.

Stereopticon lectures were given 7,447 children.

The operations performed were as follows: Extractions, 142 teeth; treatments, 11 teeth; root fillings, 9 teeth; cement fillings, 21 teeth; amalgam fillings, 1 tooth. The total cost of this service amounted to $100.50.

The mouths of 6,768 children were examined.

Totals of first and last examinations of 2,780 children receiving three or more prophylactic treatments during the year:

State of Teeth—First Examination: clean, 186; fair, 1067; dirty, 1527. Last Examination: clean, 873; fair, 1769; dirty, 143.

Color of Gums—First Examination: dark red, 647; light red, 1897; pink, 236. Last Examination: dark red, 273; light red, 1981; pink, 526.

Fistulas—First Examination, 317; Last Examination, 336.

Malocclusion, 2494.

Use of Tooth Brush—First Examination: daily, 252; occasionally, 696; not used, 1832. Last Examination: daily, 763; occasionally, 1831; not used, 186.

A number of the teachers have informed us that it is the first year that they have not had a large number of absentees on account of toothache. As time goes on we believe that the physical condition of the children will be much improved and infectious diseases much lessened with clean mouths and sound teeth.

When the dentist tells you to open wide your mouth because he isn't going to hurt you, you can begin to understand what profession Ananias followed.

Assignment of Army Dentists

Washington, D.C., Aug. 13.—The following army orders have been issued:

First Lieut. Mortimer Sanderson, dental surgeon, on arrival in the United States will proceed to San Francisco for duty at Letterman hospital, relieving First Lieut. W. H. Chambers, dental surgeon, who will proceed to Fort Huachuca, Arizona, for duty.

First Lieut. W. A. Squires, dental surgeon, on arrival in the United States, will proceed to Fort Leavenworth for duty, relieving First Lieut. H. G. Voorhies, dental surgeon, who will proceed to Fort Barrancas, Florida, for duty.

First Lieut. C. Dew Deyton, dental surgeon, on arrival in the United States, will proceed to Fort Williams, Maine, for duty.

First Lieut. J. F. Feely, dental surgeon, on arrival in the United States, will proceed to Douglas, Ariz., for duty.

First Lieut. J. W. Scovel, dental surgeon, on arrival in the United States, will proceed to Fort Sill for duty.

Capt. G. J. Holden, Thirteenth Infantry, will report to commanding general, western department, for temporary duty, pending arrival of Twenty-fourth Infantry.

First Lieut. B. M. Bailey, field artillery, is assigned to the Third Field Artillery.

Capt. N. E. Margetts, Sixth Field Artillery, is relieved from present duties and will rejoin his regiment.

First Lieut. G. F. Patten, Thirteenth cavalry, is relieved from duty at Fort Ethan Allen and will proceed to West Point, N.Y., for duty at the military academy.

Maj. Conrad E. Koerper, medical corps, is relieved from duty at Texas City and will repair to this city and report to the chief of militia affairs for instructions and assignment as inspector-instructor with sanitary troops of organized militia.

Capt. J. B. H. Warring, medical corps, is relieved from duty at Fort Logan and will proceed to San Francisco, thence to Honolulu, for duty.

Leaves of absence: Capt. A. M. Shipp, infantry, sixteen days; Capt. J. L. Dewitt, quartermaster corps, from Aug. 12 until Aug. 21; First Lieut. H. C. K. Muhlenber, Second infantry, extended ten days.

Capt. A. C. Reed, infantry, unassigned, is assigned to the Twelfth infantry.

First Lieut. S. M. Williams, cavalry, is assigned to the Eleventh cavalry.

Dentist for Khedive

Rushville, Ind., Aug. 21.—Virgil Henry, of Milroy, has received word that his brother, who has been in Africa for several years, has been appointed a dentist for the Khedive of Egypt.

Dr. Brown Wins Suit

Ashtabula, Ohio, Sept. 18.—Dr. H. Milton Brown came out victorious in his long-standing difference with the State Dental Board yesterday afternoon, when Miss Laura Lynch, his assistant, charged with unlawfully performing a dental operation, was acquitted in police court.

The charge against Doctor Brown, to the effect that he unlawfully employed Miss Lynch to perform dental operations, will be nollied, according to an unofficial opinion expressed yesterday by George B. Harris, state's attorney.

Miss Lynch was acquitted on motion by counsel for the defense that the jury be instructed by the court to return a verdict of not guilty, since the state had failed sufficiently to establish its case. After arguments by both sides, covering nearly forty-five minutes, Police Judge Parker sustained the motion and the jury was instructed accordingly. The verdict of not guilty was returned immediately.

When George B. Harris, state's attorney, put the question to the witness, which in effect, was a question as to whether the work done by Miss Lynch on the prosecuting witness, Miss Bertha Hersch, namely the cleaning of teeth, was a dental operation, counsel for the defense objected on two grounds. First, that the question was too broad to meet the facts set forth in the charge, and second, that the question was for the jury to decide, and not for an expert witness to decide.

The court sustained the objection and the state's attorney excused the witness.

The jury did not have to retire from the court room to settle the case, the decision having been taken from the twelve men by the judge, who instructed them to return a verdict for the defendant.

Discussing the case this morning, Judge Parker said the prosecution had failed to prove a violation in that evidence did not show that Miss Lynch was not qualified to perform dental operations, and did not show by expert evidence what a dental operation is.

University Dean Weds

Kenosha, Wis., Sept. 1.—(Special.)—A romance of the University of Minnesota had its culmination in a wedding this morning when Miss Franc Charlotte Hockenberger, of Kenosha, secretary to the dean of women of the university, was married to Dr. Alfred Owre, dean of dentistry and noted as a lecturer and traveler. The ceremony was read by the Rev. John Carter, of Racine. Doctor and Mrs. Owre left at once for Minneapolis, where they will reside.

Practice of Medicine Full of Superstition

San Francisco, Sept. 3.—Delegates to the Dental Congress today are still discussing the address made before the congress yesterday by Dr. Garrett Newkirk, of Pasadena, who declared that "the practice of medicine is so full of superstition that it would take a ten-mile shelf piled three deep to hold all the dyspepsia prescriptions written this year alone," and that he found the practice of dentistry more honest than prescribing a dose of mystery every hour. The fact that Doctor Newkirk was formerly a practicing physician caused his utterances to create a sensation among his audience.

Doctor Newkirk said a bottle of buttermilk was better than all the prescriptions written for dyspepsia, yet people take the prescriptions through superstition.

Dr. George H. Walker, of Los Angeles, also talked along the lines of the use of drugs in the practice of medicine and in dentistry, saying the trouble was not so much with the drugs as with the ignorance of their merits.

Married in Chicago

Goshen, Ind., Aug. 30.—Dr. E. H. Carpenter, a well known dentist here, was married Saturday to Miss Anna M. Tyson, of Chicago. The wedding took place at the home of the bride's parents, Mr. and Mrs. Geo. F. Tyson. Doctor Carpenter came here three years ago from Chicago, and since then has built up quite a practice in Goshen.

Strange Jaw on Skeleton Puzzling

Fairport, Ore., Aug. 17.—George E. Good, of La Pine and E. H. Lister, of Grant's Pass, Ore., report finding a skeleton at Prospect Tavern, near Crater Lake. The skeleton is normal in every way except the lower jaw, which is massive and in which the teeth are set crosswise to the usual setting.

The skeleton was found in a bed of charcoal underlying a bed of pumice by workmen excavating for a road.

A party of geologists from the Columbia University examined the skeleton and were unable to account for the strange position of the teeth or the abnormal size of the lower jaw.

Dr. D. Murray has moved his office from Grand Rapids, Mich., to Hastings, where he is located in the New City Bank building.

DEATHS

At Philadelphia, September 10, Dr. Francis P. Correa, of the Madeira Islands, aged 40.

At Woodstock, Vt., September 9, Dr. Herlward Burbridge, aged 43.

At Chicago, September 12, Dr. F. L. Clifford, of Racine, Wis., of apoplexy, aged 53.

At New Castle, Ind., September 3, Dr. J. W. Ellis, aged 85. He had practiced in New Castle for fifty years.

At Pontiac, Mich., August 31, Dr. W. Lindley Myer, of valvular heart trouble, following an attack of typhoid. He was prominent in professional, fraternal and social circles, and will be greatly missed by his many friends.

At Chicago, September 1, Dr. F. P. Joyce was drowned by being pinned under an overturned automobile in a ditch flooded by recent rains.

At the Kankakee (Ill.) asylum, August 14, Dr. A. J. Campbell, of Mazon, Ill. He had been committed to the institution but three weeks before his death.

At East Jeffrey, N. H., August 13, Dr. David J. Fuller, of Brooklyn, N. Y., aged 67. He had practiced in the latter city since 1878.

ROBBERIES

During the past month reports of robberies of dental offices have been very frequent, dentists in the following cities and towns being the victims:

Beloit, Wis., gold, $150.00.

LaSalle, Ill., gold, $200.00.

Bloomington, Ill., gold and clothing, $40.00.

Ottawa, Ill., gold and instruments.

La Crosse, Wis., gold, jewelry, money, $2000.00.

Winona, Minn., gold and other materials.

Red Wing, Minn., gold, $400.00.

Antigo, Wis., gold, $160.00.

Merrill, Wis., gold, $200.00.

Belvedere, Ill., gold, $25.00.

Superior, Wis., gold, $500.00.

Madison, Wis., gold, $500.00.

Fargo, N. D., gold, $25.00.

Watertown, Wis., gold, $60.00.

Many dentists report loss of cocain and other narcotics.

Classified

Advertisements under this heading, $2.00 each for 60 words or less, additional space 2 cents per word, single insertion; three insertions or more, special rate on application.

WANTED—EXPERIENCED AND HIGH-CLASS OPERATOR. STATE SALARY AND EXPERIENCE FIRST LETTER. APPLY F. W. GLASGOW, WINNIPEG, MANITOBA. 1040

WANTED—Position as an operator with some ethical practitioner in any large city of Ohio or Indiana by a man of ten years' experience. Very best references. Address W 1060, care Dental Summary.

WANTED—Salesman to represent a manufacturer of an Anesthetic on road. Must be man of exceptional ability who can sell to supply houses and assist in creating demand among dentists. Good position to the right party. Address Box 1070, care of Dental Summary.

WANTED—I am in need of a reliable, sober young dentist. Must be an average or better, all-around man; to take charge of an office in a small Ohio town. $25.00 per week to start. Better salary in view if make good. Address 1080, The Dental Summary.

WANTED—DENTAL PRACTICES—BIG LIST OF BUYERS—A time-tried system that gets the buyers without publicity to the seller. Write for information. Dentists looking for locations write for our FREE Bargain sale list. Mention States desired. "The Dentists' Middlemen," A. E. Hoag, D.D.S., Manager, Central office, Carrollton, Illinois. C. M. Cryor, D.D.S., Manager Western Office, Old National Bank Building, Spokane, Wash. 8tf

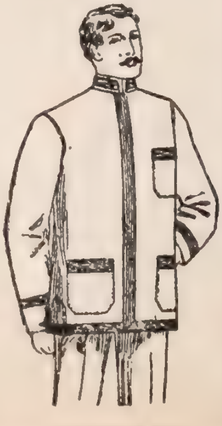
FOR SALE—Ethical practice in a 1400 Nebraska town. Office is electrically equipped, modern, and has been established 16 years. Practice has averaged approximately $4000.00 for years. Equipment was replaced four years ago and is in good condition. Liberal terms to responsible party, or discount for cash. Reasons and details upon request. No triflers, as this is to be sold quickly. Address ZEN 1010 Dental Summary

FOR SALE—Office and Practice in a little city of 1500 in Central Ohio. Business running over $200 monthly. Low rent. First class equipment in every detail; electricity. Best of people and cash business. Will also sell residence, half square from office. Will sell outfit much less than invoice. Good reason for selling. Address "Chance," 1030 care The Dental Summary.

FOR SALE—One of the best located offices in Michigan. A high-class, ethical office; can work your head off if you wish. Price, $1000.00; one-fourth cash, balance good paper. All the time you need. Don't answer unless you can do business. G. B. P. 1050, care Dental Summary.

FOR SALE—Office in Flint, Mich. 2 Columbia chairs, 2 Weber cuspidors, 2 cabinets, 2 brackets and tables, all-cord wall type electric engine, Victor electric lathe, gold rolls, roll top combination gold and plaster bench, air compressor outfit, complete laboratory, all reception room furniture and fixtures and a $300-a-month business, for $600. Address R. & R.

OHIO—Fully equipped dental office; $5000-practice; 14 years established; live town 18000; everything good condition; detail strictly up-to-date; only fire-proof office bldg.; heart of business center; elevator opposite office door; modern conveniences; compressed air, etc.; valuable live records; rare chance for good man; reason, health. Must sell at once. Thorough introduction. Address 1000 The Dental Summary.



"WEISSFELD BRAND"

Suits, Raincoats, Uniforms, Etc. Reduction Sale Until Jan. 1, '16 Suits made to order, any style $12.50 and $15 Values up to $25. Washable Coats for Dentists, Doctors, Druggists, Etc.

$2.50 each made to order, any style, values up to $7.50. Trousers to match at $2.50 made to order. Raincoats for **Men** and **Women** $5.00, 7.00 and $9.00, values up to $20.00. All rubber aprons reduced to $1.50 each, values $2.50. Write for measurement blanks, and styles free upon request. Free delivery to all points. Thousands of testimonials from satisfied customers. Order today and get best selection. Ready made washable coats for dentists, doctors, etc. $1.50. Values up to $5.00. Auto coats made to order at $2.50: values up to $10.00 Smoking jackets, bath-robes and dressing gowns at half price. Dental Chair Covers Special $2.00 per set, value $4.00

WEISSFELD BROS., **Mfrs. of Clothing and Uniforms.**
332 Broadway (*The kind they all admire*) **New York City, N. Y**

For the Information of Persons Desiring to Enter the Dental Corps of the United States Navy

A candidate for appointment to the Dental Corps of the Navy as acting assistant dental surgeon must be a citizen of the United States, between 24 and 32 years of age, a graduate of a standard medical or dental college, trained in the several branches of dentistry, of good moral character, and of unquestionable professional repute.

Should an assistant dental surgeon, Dental Reserve Corps, desire to enter the Dental Corps, he must be between 22 and 30 years of age, a graduate of a reputable school of medicine or dentistry, of good moral character, and of unquestionable professional repute. In accordance with law, however, prior to being commissioned an assistant dental surgeon in the Dental Corps he must serve three years as an acting assistant dental surgeon, as explained below.

Successful candidates are first appointed acting assistant dental surgeons, and after serving a probationary period of three years are ordered before an examining board to determine their fitness for commission as assistant dental surgeons, United States Navy.

Application should be made to the Chief of the Bureau of Navigation, Washington, D.C., via the Surgeon General, United States Navy, and according to the form prescribed. This application *must be in the handwriting of the candidate* and must be accompanied by the following certificates:

(*a*) Letters or certificates from two or more persons of good repute, testifying from personal knowledge to good habits and moral character.

(*b*) A certificate to the effect that the applicant is a citizen of the United States.

(*c*) Certificate of preliminary education. The candidate must submit a certificate of graduation from an accepted high school or an acceptable equivalent.

(*d*) Certificate of dental education. This certificate should give the name of the school and the date of graduation.

(*e*) If the candidate has had special educational or professional advantages, certificates to this effect, signed by the proper authorities, should also be forwarded.

The applicant will save unnecessary correspondence if he will make sure when submitting his application that the qualifications enumerated above are clearly and plainly described in his letters or certificates.

FORM OF APPLICATION

(This form is not to be filled in here, but copied on a separate sheet in the handwriting of the applicant.)

....191....

SIR: I request permission to be examined for an appointment as acting assistant dental surgeon in the United States Navy. I was born at............................, and was......... years of age on the....................day of....................................., 191....; am a citizen of the United States, residing in............................, county of.............................., in the State of.................... I am a graduate of.........................dental (medical) school, in the State of..............................., and was licensed to practice dentistry in the State of........................in....................

I forward herewith letters testifying to my moral character, habits, citizenship, preliminary education, professional education and qualifications.

Very respectfully, ...

THE CHIEF OF THE BUREAU OF NAVIGATION,
Navy Department, *Washington, D.C.* (via The Surgeon General, United States Navy).

A candidate whose qualifications are satisfactory will receive a formal permit to present himself for examination.

THE EXAMINATION

When a candidate presents himself for examination he must bring with him the testimonials as to character and professional fitness, diploma of preliminary and professional education, and a certificate that he is a citizen of the United States: those forwarded with his application being returned to him for this purpose.

The examination is conducted in the following order: I. Physical. II. Professional. III. Collateral.

I. PHYSICAL EXAMINATION

The physical examination is thorough, and the candidate is required to certify on oath that he is free from all mental, physical and constitutional defects. (Applicants are advised to carefully read the special circular regarding physical qualifications inclosed.)

Acuteness of vision, 12-20 for each eye, unaided by glasses, but capable of correction, by aid of lenses, to 20-20 is obligatory. Color perception must be normal and the teeth good.

If the candidate is found to be physically disqualified, his examination is concluded; if found to be physically qualified, his examination is continued as follows:

II. PROFESSIONAL EXAMINATION

1. Letter to the board describing in detail his general and professional education.
2. Tests of skill in practical dentistry.
3. Proficiency in the several usual subjects in a standard dental college course.

THEORETICAL (WRITTEN AND ORAL)

Anatomy, physiology, histology, physics, chemistry, metallurgy, dental materia medica and therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative dentistry (theory), and prosthetic dentistry (theory).

PRACTICAL (CLINICAL)

Operative dentistry and prosthetic dentistry.

III. COLLATERAL EXAMINATION

This examination is oral, and is conducted in the following subjects: Arithmetic, grammar, general history, physics, general literature, and Latin.

Applicants holding diplomas or certificates from reputable literary or scientific colleges, normal schools, or high schools, may submit such diplomas or certificates for the consideration of the board in this connection.

A successful candidate, upon completion of his examination, will be notified by the president of the board that he has been found qualified.

With the consent of the board, a candidate may withdraw at any period from further examination, and may at a future time present himself for re-examination. The board may conclude the examination (written, oral and practical) at any time, and may deviate from this general plan as it may deem best for the interests of the naval service.

No allowance will be made for the expense of persons appearing for examination.

The tenure of office in the Dental Corps of the Navy, except in the case of acting assistant dental surgeons appointed for temporary service only, is for life, unless sooner terminated by removal, resignation, disability, or other casualty.

All officers of the Dental Corps are retired from active service at the age of 64 years, and when so retired (or when retired from active service for disability or other casualty contracted in the line of duty before that age) receive an annual pay for life amounting to three-fourths of the pay of the grade or rank held by them at the time of retirement, including the increased pay allowed for length of service as explained below.

When an officer of the Navy, including dental officers, has been 30 years in the service, he may, upon his own application, in the discretion of the President, be retired from active service and placed upon the retired list at an annual pay for life amounting to three-fourths of the pay of the grade or rank held by him at the time of retirement, including the increased pay allowed for length of service.

Immediately upon official notification of the death from wounds or disease not the result of his own misconduct of any officer of the Navy, the Paymaster General of the Navy shall cause to be paid to the widow, and if no widow, to the children, and if there be no children, to any other dependent relative of such officer previously designated by him, an amount equal to six months' pay at the rate of pay received by such officer at the date of his death, less $75 to defray expenses of interment; and the residue, if any, of the amount reserved shall be paid subsequently to the designated person. No deduction shall be made on account of expenses of preparation or transportation of the remains.

When traveling under orders by other than public conveyance, officers of the Navy, including dental officers, receive 8 cents a mile to defray the expenses of such travel performed from point to point within the United States, and when so traveling abroad are allowed actual personal expenses estimated on a liberal basis in accord with the position of the officer, both as regards admissible items of expense and the cost of such items.

For every five years' service the pay of officers is increased 10 per cent. (though not to exceed 40 per cent), calculated on the annual base pay of their grade, as shown in the appended table.

When an officer goes to sea or leaves the continental limits of the United States under assignment to stations or for the performance of other duties beyond the seas, his pay is increased 10 per cent.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV NOVEMBER, 1915 No. 11

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

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L. P. Bethel, M. D., D. D. S., Editor-in-Chief

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Foreign, U. P. U. Countries, $1.75. **Advertising Rates on Request**

Neither the editor nor publisher is responsible for the views expressed by authors in the reading matter published by THE DENTAL SUMMARY

REGULAR CONTRIBUTIONS

THE SIGNIFICANCE OF THE PULP CANAL OPERATION*

BY ELMER S. BEST, D.D.S., MINNEAPOLIS, MINN.

YOU ARE FAMILIAR with the marvelous strides the profession of dentistry has made in recent years. One of the penalties which we must pay for such progress is that our responsibility increases in proportion.

During the latter part of the nineteenth century the practice of surgery passed through what was probably its greatest crisis. The surgeons had become cognizant of the fact that the suppuration of wounds was the result of microbic infection from unclean hands, instruments, etc.

Instead of profiting by the experience of the medical profession along this line, we have decided to do our own pioneering and meet and overcome the same obstacles which they did. This attitude of ours brings us face to face with our crisis, which is the chronic abscess following pulp canal surgery where we had depended upon antiseptics and incomplete operation instead of asepsis and complete operation. The surgeons passed through their experience and yet we must needs pass through ours in order that we may learn in the school of experience.

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*Read before the Michigan State Dental Society, 1915

When one calmly and critically surveys and analyzes the condition under which pulp surgery is usually performed, it is a marvel that instead of fatalities we have been allowed to escape as lightly as we have. In this respect nature has been good to us, but not in the manner in which she is generally given credit, that is, as is commonly assumed, that we can do a careless operation and that nature will take care of it. She does not, to the extent we have imagined; our real results have been a case of cause and effect as the following will show:

An examination of 288 cases of pulpless teeth showed the following conditions:

Mechanically defective operations with rarefied periapical areas, 177.
Mechanically defective operations without rarefied periapical areas, 41.
Infected areas from gangrenous pulps, 44.
Mechanically perfect canal operations, 15.
Mechanically perfect canal operations showing rarefaction, 1.
Vital tissue under canal filling, 7.
Infected areas over vital teeth, 2.
Arsenical necrosis, 1.

We will now consider for a few moments the various sources of infection in the roots of teeth and the periapical areas.

Class 1: From saliva, unclean instruments, cotton, chip blowers, canal points, unclean hands.

Class 2: Bacteria as a thrombus lodging in blood vessels of pulp, causing interruption in the blood supply and an area of lowered resistance favorable to the proliferation of bacteria in thrombus.

Class 3: Pulp tissue having become non-vital as a result of trauma or the use of arsenic may become the seat of infection owing to the growth of bacteria which were in the circulatory system at the time of its death, or later.

Class 4: Removal of all the pulp tissue and the failure to fill the root to the apex, leaving a space in the root apex where bacteria may proliferate, away from the immunizing mechanism or action of the phagocytes. The bacteria may become lodged in this area escaping from the general circulation where they were in existence as the result of a general invasion as in an attack of grippe, or a focus of infection some place else in the body.

Class 5: Destruction of periapical tissue from drugs such as arsenic or formalin used as treatment and dressings in pulp canals, causing an area of lowered resistance by causing actual destruction of the attachment of the peridental membrane, leaving denuded cementum which maintains chronic focus indefinitely, and would be favorable to the proliferation of bacteria, whether introduced through the canal or from general circulation.

An examination of 26 cases of chip blowers and used barbed broaches revealed 15 cases producing pyogenic organisms.

Twelve tests of cotton in cotton holders in common use showed 9 cases of pyogenic organisms.

Nine cases of sterile cotton handled by unclean hands showed 7 cases to be infected.

In our experiments we found that in 9 cases where periapical infection existed and where the pulp was infected that we found the same germ.

We also found that in twelve cases these pyogenic bacteria were in existence in pulp canals which contained non-vital tissue, and we found in seven cases so-called germicidal pastes or preparations.

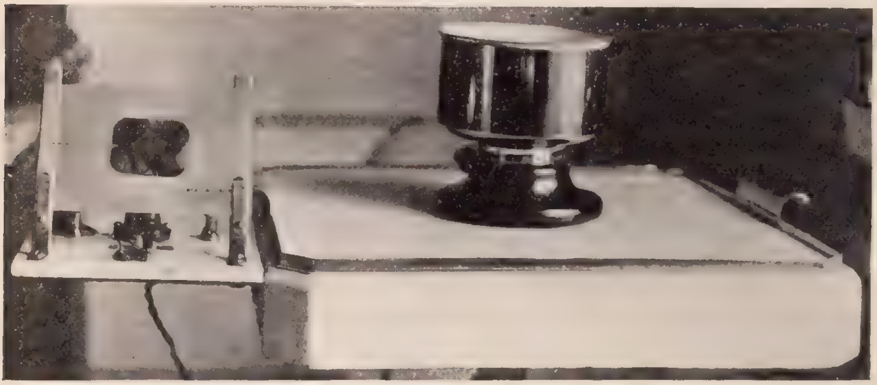
Six cases of infected canals showed no apical disturbances.

Before commencing with the technic of this operation, let us for a moment consider some of the instruments and equipment necessary for this work.

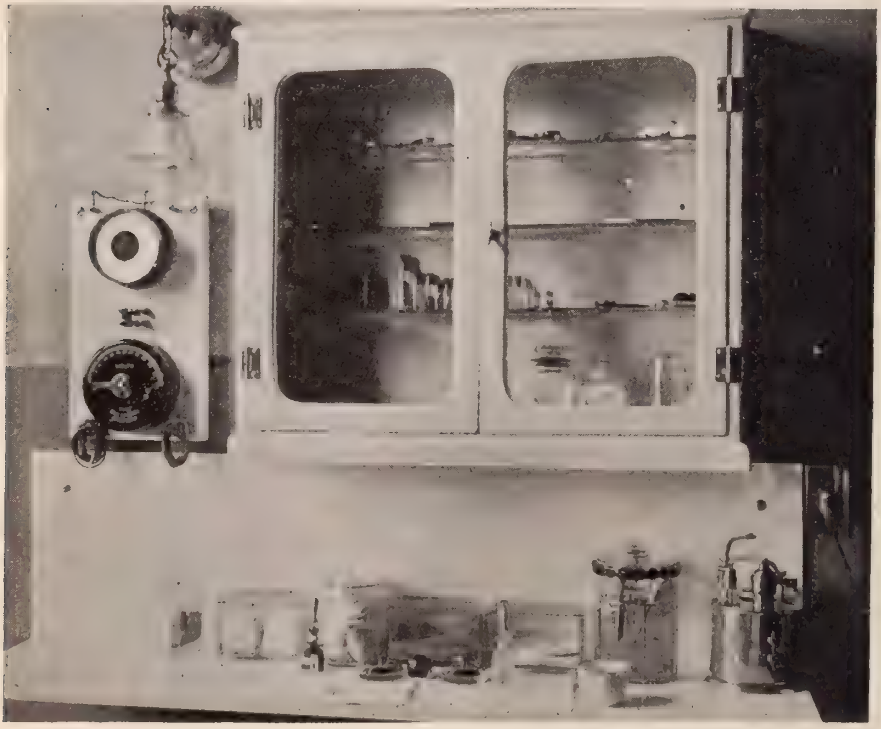
Small dressing sterilizer

First we must have a good sterilizer for much of our equipment must be boiled before and after each operation. Then comes the dressing sterilizer for the sterilization of the cotton canal points, the dressing bristles, gauze pledgets, cotton pellets, napkins, gauze sponges, etc. Then we have a small bur and broach sterilizer. (Doctor Otteson, of Christiana, Norway, who was in this country recently, gave me the idea for this little outfit, and though I could not get the one which he was using, I rigged up one which suits me so well I could not get along without it. I selected a four-inch electric stove and placed around it a two-inch brass collar. Inside the collar was placed a four-inch porcelain cup. When the brass collar was nickel plated it made quite an attractive little outfit, and being small it can occupy a place on the bracket.)

The dressing bristles, of which one should have several, are made of metal which will not rust and are set in aluminum handles. The bristles are wrapped with cotton and in lots of six are placed in a wrapper made of linen, each lot being separately wrapped in a six-inch square of gauze.



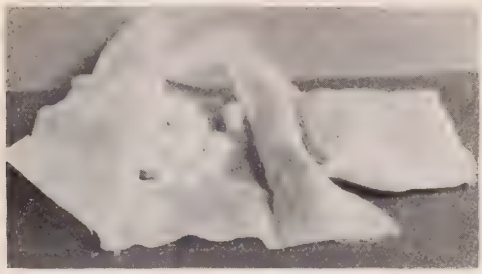
Bur and broach sterilizer and illuminator



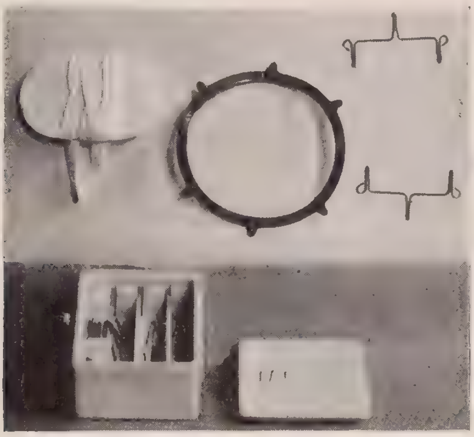
Glass jars containing sterilized cotton gauze, dressing bristles, etc., waste dressing cup, medicine bottles, hypodermic outfit.

The paper canal points are folded up in lots of six in the same style of gauze; also the cotton pellets, which can be purchased in quantities already rolled, are made up in small packages of from twelve to twenty pellets in a package. Then we have the gauze pledgets which are six by six pieces of gauze, folded with one corner turned back.

Now, we will commence to operate, and keep in mind if you will that we will now attempt to do something which has been considered by many rather impracticable in the past, and that is an *aseptic pulp canal operation.* Spray the mouth and paint the gums in the region of the operation with iodin, being careful to have the gums dry before applying it. Now adjust the rubber dam with a rubber dam holder, *which can be sterilized.* When adjusted, paint the teeth included and the dam surrounding the teeth with iodin, then alcohol.



Sterile cotton pellets



Rubber dam holders, gutta percha canal points.

Now we will assume that we are operating on a tooth thath as a large cavity and the pulp is so involved that it can not be saved. We have injected our anesthetic and will work without having to contend with pieces of vital tissue in the canals, which have proven annoying on so many occasions. Carefully remove all the decay and wipe out the cavity with iodin. With a pulp chamber bur which has just been taken from our bur and broach sterilizer, we open the pulp chamber freely, exposing to full view and access all the canals.

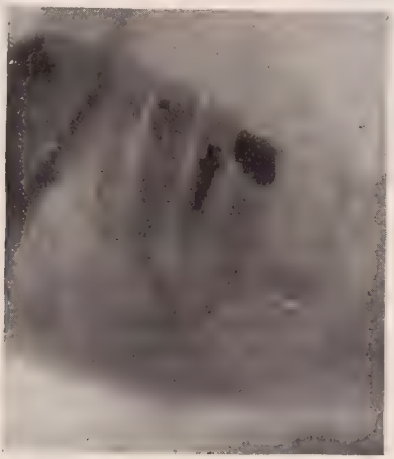
Now we will select what we consider a difficult canal to open. Here we find the Dowling Transilluminator of great help in those cases where we have lost the course of the canal. Take a fine, smooth bristle and gently force it into the canal, very gently and patiently work it along the canal toward the apex. If it buckles or turns on itself, try another, and yet another, and if they fail try an extra fine spiral broach which is much more rigid. With either one or the other we can, in most cases, reach the apex and if we can, the success of the mechanical part of our operation is almost certain, for we now operate from the apex back.

Dowling trans illuminating lamp, Rhein picks.

Spiral broaches

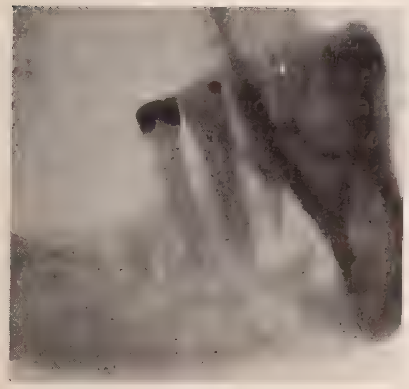
Pulp canal files

We are now operating with a radiograph of the case on our bracket in a small illuminator and know approximately the length of the root. When we have reached approximately the apex with the bristle and it is a very tight canal, we place a small drop of 30% sulphuric acid on the bristle and by moving the handle in a sweeping motion we carry the acid to the end of the bristle and push back the walls of the canal. This is continued until the bristle moves back and forth easily in the canal. It is now removed and bicarbonate of soda introduced. When the reaction has subsided the moisture is absorbed as well as possible and a spiral broach is introduced. This is worked into the canal and each time it is turned in the direction of its thread it must be pulled back. This accomplishes two things: it prevents the instrument from becoming wedged and breaking off in the canal and also is the means of cutting down the walls. This process is kept up until we near the apex, when we substitute the files which are somewhat similar to the spiral broaches, but have a much closer spiral and have a sharp cutting edge which is turned out so that when the instrument is placed in the canal and drawn out it cuts down the wall of the canal. We keep increasing the size of the instrument until we have the canal sufficiently enlarged, when we place a sterile measurement wire in the canal and bend it through a groove which we have cut in the margin of the cavity over the opening into the canal, seal the tooth and have it rayed.

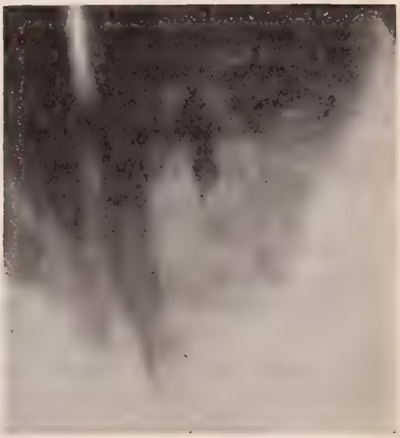


Case 1—Plate 1, right side. Shows two bicuspids to be pulpless and should be closely examined with small film

When the film is ready, which is about the time it takes the patient to get back to the chair and have the rubber dam adjusted, we remove the measurement wire and place it on the film to see if there is any distortion. If not, we note on the patient's chart the exact length of the root. This

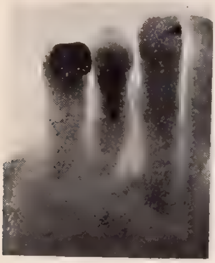


Case 1—Plate 2, left side.
Shows two small pieces of roots

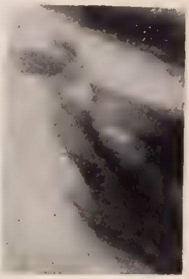


Case 1—Plate 3.
Upper anterior, taken with Eastman No. 2 film; shows necrotic root of central.

is for future reference in case a post is inserted for bridge abutment. In case we have not reached the apex, sodium-potassium may also be used on a very fine broach and an effort made to penetrate further. Get as far as possible with this and then use sulphuric acid, as suggested by Doctor Callahan. I have recently found a sulphuric paste which can be carried into a canal on a broach almost as readily as the sodium-potassium. If it is a curved canal we must depend upon our ability to work around the curve with a bristle and the chemical or cut back the walls of the canal as Doctors Callahan and Rhein have suggested and then continuing into the canal. If it is a straight root we can make excellent progress with a set of instruments, which I reckon are without a name, as I understand there are only a few in existence.



Case 1—Plate 4
Sharper outline and detail of area under suspicion in plate No. 1.



Case 1—Plate 5
Taken of area located in No. 2 film. Shows sharp outline of root surrounded by necrotic area.

It is one of the most ingenious devices I have ever seen. It consists of a set of drills which come in dozen lots and which fit into a small mandrel for the hand piece and also the right angle. It is about the only drill I have ever seen that I could feel any degree of comfort in using in the canal when using the engine. If it is considered advisable not to use the engine, which I think is generally the case, we have a handle which is quite heavy and affords a good grip. The small mandrels fit into this handle and we can use them in this way. The little drills are so constructed that they have one weak point, and before they will stand enough pressure to break near the apex, they will come apart where they enter the mandrel. The Downie and Kerr reamers, of course, have their place at this stage of the operation.

Now we assume that we have at last reached the apex. The case is again rayed with measurement wire and we are now ready for the filling of the canals. This I am now doing as has been advocated by Doctor Callahan, to whom so much credit is due for the work he has done in this line.

Our solution of chloroform and rosin is placed in the canal and a cone selected from its bath of alcohol. The cone is pumped up and down in the canal until it is dissolved. The canal is filled about three-fourths, the remainder is filled with oxychlorid of zinc cement. The case is again radiographed and if satisfactory we can give a sigh of relief and feel that again we have done a real service for humanity. It has been hard work and in the case of the molar has consumed not a half-hour, but more likely four or five hours.

In closing let me say that no longer can it be said that simply because we do not have the symptoms of acute septic pericementitis or the establishment of a fistula that that particular pulpless tooth is not giving the patient very serious trouble or that it is not rapidly becoming the seat of very serious trouble later on. What we do not know *for a fact* we must not state *as a fact*. Having assumed the responsibility which our patients place upon us in this operation, let us do it in a manner which will not reflect upon our ability.

DISCUSSION

Dr. Albert Leland LeGro, Detroit: The subject that Doctor Best has so ably handled this morning, next to pyorrhea, is perhaps the most important in connection with the science of dentistry. I say next in importance for the sole reason that there is more pyorrhea than any other class of infection that occurs in the mouth. Every tooth may be affected with pyorrhea and it is a rare case where as many as four teeth or periapical areas in a single mouth are infected. One seems to be just as toxic as the other, and the harm done is measured only by the amount of tissue involved.

Doctor Best's radiographs speak eloquently of the significance of pulp canal operations and emphasize more adequately the gravity of it all. We have all been guilty of executing imperfect root canal operations and in fact but a very small percentage of our canal operations that we are doing today are successful from a surgical point of view. Now it is just such men as Doctor Best and Doctor Callahan and Doctor Rhein who keep continually hammering at us, who are going to awaken you and me and the whole profession to the significance of more care and better technic in this particular field.

To quote Prof. Hecker, of Kansas City, "The oculist examines the teeth and the gum of his patients, for he has learned that if they are diseased, their condition affects the eye reflexly."

The aurist has learned that unhealthy teeth and gums are factors of great importance in diseased conditions of the Eustachian tubes and the middle ear; the laryngologist examines the teeth and gums, for he, too, has learned that they are factors in the production of tonsilitis and diseases of the throat. The internist of today is not like his colleague of a few years ago who laughed at the possibilities of complications resulting from diseased teeth and gums, for he has learned that they are of importance in such diseases as are the result of micro-organisms, pathogenic in type.

The tonsil, we are taught, is one of the common avenues for the invasion of micro-organisms into the body. As a rule micro-organisms are held in suspension in all pus that exudes from fistulas of the alveolus. In the act of swallowing, a portion of it passes over the tonsils. Some of the organisms contained in the mixture of saliva find lodgment in the crypts of the tonsils. After an indefinite time they commence to grow and by their growth, inflammation results. As a result of this process the normal resistance of the tonsil is lowered, after which the organisms in all likelihood gain ingress into the lymph stream and thence to the general circulation. After their ingress they are carried to the finer capillaries and if the bodily resistance is low, they are lodged in them and soon commence to grow. If the point at which this process happens is the endocardium of the heart for instance, an endocarditis will result. This is not a mere dream but a process that actually occurs. From these examples can be readily conceived the possibilities resulting from diseased apical areas and demonstrates the significance of pulp canal operations.

I once asked the chief internist of one of Detroit's large hospitals just how far reaching, in his opinion, was the effect of focal infection in the mouth and especially in the alveolus upon the human system, and he gave me the following statement: "So many diseased conditions can be attributed to focal infection in the mouth and its effects that one is overwhelmed at once and cannot decide which is the worst or most common. The auto-toxic condition is the most prevalent one encountered; next comes arthritis, endocarditis, myositis and pains generally that are called neuralgias and rheumatisms. The alimentary canal conditions include chronic gastritis, enteritis and colitis. The blood discraysias include simple anemia and leucæmias, and last but not least, arterio sclerosis and its sequence, high blood pressure.

In view of the fact that the medical profession, after many years of groping around in the dark, have, through Doctor Hunter, of London, and a very few pioneers in diagnosis by the process of elimination, suddenly awakened to the, to them, surprising intelligence that the teeth often cause many of the ills that were formerly laid at the door of many less logical factors. This is largely due to the fact that internal medicine has to a large extent for some time now been recognized by the medical profession as a failure and in order to follow out the prophylactic propaganda that necessarily had to come, they have finally arrived, though the dental profession feels at this time that they are overdoing the matter and laying much at the door of this vocation that is not really its due.

In his description of technic, Doctor Best has given you much that is valuable, but as I told one of our prominent dental educators just the other day, even though you tell an operator or a student just what to do, advise him of the many pitfalls, etc., he will have to first make his mistakes in order to drive the importance of it home. A knowledge of what to do is good, but the delicate touch and careful operative technic that is necessary to do this work successfully comes only to a few, and can hardly be taught by word of mouth.

The best advice that I have ever had and that I did not find easy to take, was the admonition of an old preceptor who said, "Never fight the canal, and go along the lines of least resistance carefully." The next most valuable advice was given me by Doctor Ottolengui, who said: "After you have been fishing carefully for the longest possible time for the continuation of a canal and have made up your mind that it is impossible to get any farther, take a hitch in your belt and a new instrument and start over, and in the majority of cases you will win." I have found both of those pieces of advice to be sound, and of great value to me.

Show me the kind, number of varieties and condition of an operator's nerve canal instruments and I will tell you how little harm he is doing to humanity, and I will also be able to size the man's ability pretty closely. Except to open the canals to gain access to them, the engine nerve canal drill has ruined more teeth than it has saved.

In regard to the theory of sterile conditions absolutely, I laughed at the idea when it was first propounded to me. It is true that our college professors taught it if they did not require us to live up to it in the college infirmary, but I thought it was a ruse to have us more tidy than for anything else. Now that I see the necessity of these conditions, I am astounded at the large number of really clever men in the profession who pooh-pooh the idea, or if they don't, they continue to ignore these precautions and in some cases are perfectly frank about it. Nerve canal drills and screw broaches in the hands of anyone but an experienced man do a great deal of harm, for it is the natural inclination of all operators to fight the canal. Pressure as though a gimlet is being used in wood has no place in the canal operation; in fact, I believe that there is no canal in any tooth that is capable of being opened to the apex and filled that requires the slightest amount of pressure. Doctor Best's advice to work from the apex backwards is excellent, and is something to keep constantly in mind, even though it is sometimes, or I might say often, impossible. When the pulp chamber is opened and before the contents of the canals are touched with a broach, a groove may be made with spoon excavators, starting with one that will go into the canal a bit and then using three consecutive sizes, making a smooth approaching groove parallel with the canal or on the same curve that you determine the canal is to take. This groove, if properly done, will be but a continuation of the canal to a point where the placing of the instrument to be used will be definite each time and will follow right on into the canal. This groove is made by inserting the spoon into the orifice of canal and grooving from the orifice of the canal outwards. I have tried Doctor Best's way of using a pointed instrument on the engine to make a hopper-like entrance to the canal, but consider it inferior to the method described, for the reason that in a funnel shape there is nothing to decide just what angle the instrument takes after it drops into the orifice of the canal while in the way described the instrument is pointed right from the start.

Now we are ready to remove the canal contents. A Donaldson broach, or one just as good, is generally used, and if it is a new one as it should be, extreme care must be taken in sliding up into the canal to engage the contents so that the sharp broach will in no way roughen the naturally smooth surface of the canal itself. The slightest roughness produced very often makes the work of getting into fine canals very difficult and will start a shoulder or bridge-over quicker than one can imagine. After the canals are all cleaned out and access has been had to the apex dessication must be resorted to and this is best accomplished by use of the compressed air blown into the tooth for many minutes until the whole tooth has been dehydrated. Now, a fine Young canal broach is placed into the canal clear to the apex and a drop of Callahan's sol. of rosin and chloroform is coaxed to the apex (very thin) by capillary attraction mostly.

This is dried out and a bit of eucapercha is inserted on a very fine broach (smooth). It will be found that chloropercha and eucapercha will stay put on any rosined surface so that one may feel that the apex has been reached with either of these materials and is going to stay there. Next a small cone, about one-fourth inch in length, is introduced on the fine smooth broach and the apical one-fifth, one-eighth, or whatever it might be, is sealed. A radiograph is now made to determine how successful the operation has been. If it has not been successful there is the minimum amount of material to remove and start over again, and if a success, it is registered; it is a very simple matter to fill the rest of the canal. In conclusion I will say that I am glad to know that Doctor Best has given up the idea of using paraffine and bismuth. I have been using it to some extent, and while I think that it is tolerated at the apical foramen better than any other material that I know of, I have serious doubts as to its efficacy so far as permanency is concerned.

Doctor Best has done much in the past two years especially to awaken us to the necessity of more perfect work and the significance of the same, while other men have merely told us what to do. It is a grand work and I feel that we are to be congratulated on having such a man with us at this time.

Dr. W. A. Giffen, Detroit: I am very glad to congratulate Doctor Best for demonstrating to us so well the difference between the right and wrong way of performing pulp canal operations. Many of us are aware of the fact that these operations are performed carelessly by other dental operators occasionally. The doctor has outlined for us very beautifully a systematic technic for performing a clean and careful operation. I am certain if we follow his advice we shall all have a better chance to enter the Kingdom of Heaven, as there is no doubt in my mind that many lives are being shortened every day by careless pulp canal operations, which in time will cause serious systemic diseases.

Our mission is to assist nature rather than handicap her, which is exactly what we do every time we leave the pulp canal in a condition that is certain sooner or later to become septic.

Again, if we perform an aseptic operation, it will be unnecessary to use strong volatile antiseptic remedies in the canals afterwards, to counteract poisons we may have introduced by using unclean instruments, and which cause destruction of periapical tissues, including the peridental membrane.

I believe the principle of attempting to reach the apical foramen and working back towards the pulp chamber to be the correct method when you are reasonably certain that you have any poison in the canal neutralized.

I notice the doctor has switched from paraffine to rosin, and that he has given Doctor Callahan credit for pioneer work along this line. I believe the rosin solution can do no harm, that it will protect the peripheral openings as well or better than anything we know about, and with the gutta percha cones properly worked in, we have probably the best filling, but here is a point I wish to make: we know that we have no perfect filling. A filling with moisture cannot be a perfect filling after the moisture has gone. Again, we have too many methods, nearly every operator having a method of his own.

Why can't we have one best method, a method that could be adopted by the profession and practiced by them universally? There must be a scientifically correct material to fill canals just as efficiently and perfectly as there is a generally adopted agent called gasoline to run a motor. While we may have the ability, we probably have neither the time nor the opportunity to work it out, but we are willing to pay for having it done; in fact, we are paying a number of supposedly wise men at present, called our National Dental Association Research Committee, to work out such things for us.

I believe the plan to be a good one and that it should have the moral and financial support of each one of us; however, I must say that I am getting rather skeptical about the present management.

It is time they showed us something besides verifying what Doctors Hunter, Billings, Rosenow and other members of the medical profession have already pointed out to us.

This committee is working on new alloys and combinations of metals, which are all right in their place, but here is a fundamental question, and one of the basic principles of our profession in saving teeth and health.

It seems to me they should get to work to find out the most efficient instruments for doing this work and how to use them; whether there is a better lining for canals than rosin, and the most perfect filling material for root canals, and how to use it; always remembering that it must, or should, be permanent, neutral, insoluble and impervious to the X-ray, so that we may check up our work and be certain if we have used filling materials to the apical foramen, or "just hot air."

We need these things far more than we need a substitute for platinum, and if the National Research Committee will settle the question of which is the best root canal filling, and put their official O. K. upon it, I feel certain the profession will accept their verdict and cheerfully furnish the necessary financial support for future work.

Dr. M. L. Ward, Ann Arbor: I want to take the liberty again of referring to the statement I made in discussing Doctor Honey's paper, relative to the use of the radiograph. Again the essayist has made the statement, or I took it to be so, that he rays every case. That is a thing that I do not believe is the impression to be left here, because I am in the same position another doctor was in the other morning with his senior medical class, and he said, "If they aren't going to be in position after they get out to ray every case, then we shouldn't teach that to them. We should teach them to be good diagnosticians, because if I get good diagnosticians out of them, and then they get stuck with that information, then the radiograph will make stronger men out of them than to use it before exhausting all the diagnostic information available."

I am heartily in accord with the statement of Doctor Giffen that there is nothing of so much importance as root canal work. No structure that can be put upon it is worth much unless there is a good root canal filling. The thing I want to emphasize is to learn to see every single possible thing there is, and don't go into the corner room and get a radiograph until you have done all you can. Possibly the radiograph will show you a little difference in the thickness of the tooth, and that you can plane a little more here than there, and you may go farther than before. That is what the radiograph does for us.

Doctor Best (closing): I must confess that I am rather surprised at Doctor Ward's attitude, in view of the fact that the radiograph so frequently reveals to us the real cause of certain troubles which we are investigating and it saves us so much valuable time and is such a big step in advance when used for diagnostic purposes that to me it is not a luxury but an absolute necessity. I cannot agree with the idea of exhausting all other diagnostic aids and then as a last resort using the X-ray. I am firmly of the belief that one of the real reasons why the dental profession find themselves in their present embarrassment with regard to root canal work is because they did not have the means at hand of determining what they were doing. I do not mean by this, of course, that the use of the X-ray will solve all of our problems in pulp surgery, but it gives us more chance to fight in the open, and I think we should all welcome this opportunity.

CONSERVATISM *VS* RADICALISM*

BY C. C. CURTISS, D.D.S., GREENFIELD, OHIO

> "Knowledge and wisdom, far from being one,
> Have oftimes no connection. Knowledge dwells
> In heads replete with thoughts of other men,
> Wisdom in minds attentive to their own.
> Knowledge, a rude, unprofitable mass,
> The mere material with which wisdom builds,
> 'Til smooth'd and squared and fitted to its place,
> Does but encumber whom it seems to enrich.
> Knowledge is proud that he knows so much—
> Wisdom is humble that he knows no more."
>
> —*Cowper.*

THE DICTIONARY TELLS US that conservatism means "a tendency to preserve from decay, loss or injury," and radicalism means (in the present sense) "extreme," and I hold that both may mean rationalism and in the strict sense of our profession are, or should be, so delicately and profoundly mixed as to result in perfection.

In the profession of dentistry, as in the profession of medicine, the tendency is to go to extremes with methods which are new or comparatively new, forsaking old and well-trodden paths for the allurements of those which are new and unexplored. From time to time we have gone through periods of extreme changes, generally resulting in many grave mistakes which proved to be detrimental both to the practitioner and to the community. Any new feature is apt to be taken up by some, and in many cases exploited beyond reason. I will endeavor to call your attention to a few subjects in which such radicalism is indulged in.

ORAL PROPHYLAXIS

At the present time we hear a great deal about oral prophylaxis and the necessity for educating the masses in the subject.

There is absolutely no question in regard to the importance of the subject and the desirability of impressing upon the laity the necessity for practicing its precepts, but there is a lurking suspicion in the minds of many, that some of those who are most active in spreading its propaganda are not actuated solely by altruistic motives.

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*Read before the Ohio State Dental Society, Dec., 1914.

There are some who aim to specialize in the practice of oral prophylaxis, but while I am confident of the advantages of specialization in most cases, I do not think the time is yet ripe for specialization in this branch, unless it be included as a prerogative of those who specialize in the treatment of pyorrhea. It is so important and so fundamental a principle of dental practice that it should be an integral part of the work of every practitioner.

In speaking of susceptibility and immunity to caries, Marshall says: "At the risk of being considered over-sanguine, the writer suggests that a means of preventing caries will yet be discovered and that it will be in the nature of an antagonist to those organisms which have the power of forming gelatine in oral fluids."

Doctor Low, Doctor Waugh and others have been working along this line in their experiments in regard to efficacy of the sulpho-cyanates in obtaining that result, and while no definite conclusions have as yet been arrived at, it is a subject which deserves careful consideration and study, and more of us should enter that field of research. Prophylaxis has done much for the science of medicine and there are many reasons why it should do even more for the science of dentistry. I am informed that the death rate for New York City has diminished almost one-half in the past thirty years. Since we now appreciate the important bearing that oral prophylaxis has upon the general health, may it not be that the lower death rate is in great measure due to the better care given by the present generation to the mouth and teeth, as well as to general hygiene and prophylaxis?

CAVITY PREPARATION

Many of the new theories in regard to cavity preparation, fillings and inlays have come to us from the energetic workers of the Middle West, and have been quite generally taken up by practitioners in all parts of the country. Few there are, at the present time, who endeavor to fill proximate cavities in bicuspids and molars as simple ones. The value of the step-anchorage, extension for prevention, wedging gold between cavity walls and obtaining proper contour and contact, are pretty thoroughly understood and quite generally practiced.

It is not considered ultra-radical to resort to the extra cutting necessary to make these cavities complex instead of simple ones. It facilitates access and gives much better anchorage as well as decreases the liability to failure from recurrence of caries. The only excuses for not resorting to such extension would be, *first*, where there is a wide permanent separation between the teeth; *second*, where the adjoining tooth is missing and there is no necessity for, or probability of, inserting an artificial substitute; and *third*, when we have a cavity extending along the cervical aspect of the interproximal space, with considerable recession of the gum and ample room to get at the cavity from the embrasures. Doctor Black has called attention to the necessity for a good broad base for fillings in such cavities, as well as good anchorage in the step portion. Such cavities are well adapted to the combination of non-cohesive with cohesive gold, but in making this combination we must not make the mistake of using too much of the non-cohesive gold, especially in cases of strong occlusion. In such cases we must avoid the mistake of having the strip of filling uniting the proximate portion with the occlusal too narrow or of insufficient depth. We must have a sufficient bulk of filling either in width or depth at that point in order to insure stability. In filling such cavities entirely with cohesive gold, we can often get better results at the cervical margin if we thoroughly condense and polish that portion of the filling as soon as the gold is well anchored or wedged between the lateral walls of the cavity or before the contour is completely restored. Since the teeth are more narrow at the necks, there is more room for the condensation and finishing process at that stage than after the contour is built on.

EXTENSION FOR PREVENTION

The much-talked-of "extension for prevention," while undoubtedly sound in principle and excellent in practice, is sometimes abused, or perhaps we should say, has been overused by some of its votaries. No one appreciates more than I the value of this principle; and while Doctor Black probably was not the first to recognize the advantages of this method, he certainly deserves great credit for elucidating its theories and bringing it to the general notice of the profession. If I am not mistaken, Dr. S. G. Perry, of New York City, first called attention to some of the features of this method many years before it was brought out by Dr. Black, and no doubt others may have practiced it, in part at any rate, before it was spoken of by Doctor Perry; but the fact remains that it took the analytical mind and painstaking researches of Doctor Black to systematize it and bring out the proper theories to account for its advantages. When Doctor Black first called attention to this method there were some, who, not thoroughly understanding its principles, practiced it blindly and promiscuously, in many cases doing more harm than good by needlessly sacrificing good tooth structure and cutting beyond the limits prescribed, into zones of susceptibility instead of stopping in the zones of comparative immunity.

There were others also who, while they understood its principles, did not recognize the fact that nearly all rules may have their exceptions, and practiced the method in its entirety in all cases, often to the detriment of the tooth and the patient.

You are all undoubtedly familiar with the teachings of Doctor Black in regard to this method, so I am not going to take up your time to describe its advantages or disadvantages; but let me say, I certainly am of the opinion that it has its limitations and that we should be conservative in respect to its use. Conservatism in this connection calls for a consideration of the various conditions modifying susceptibility and immunity to caries in each individual case, and also the susceptibility of the pulp to various forms of irritation. It is unquestionably true that some pulps will succumb more readily to the action of irritants than will others, and if we have a history which indicates a lack of tone or ability to withstand shock in the pulps of certain individuals, this condition should be considered in making the decision as to whether to resort to conservative or to radical measures in any given case. When the susceptibility to caries is great and the general condition of the patient will permit, cavities should be extended to reach the areas which have been found to be comparatively immune to caries.

Johnson, in his work on operative dentistry, sums up the case very clearly when, in speaking of the treatment of proximal cavities in anterior teeth, he says: "The treatment naturally resolves itself into two general classes, those cavities which are prepared with a view to the permanence of the filling, and those which are prepared knowing that the filling will be more or less temporary."

The varying circumstances that influence the permanence of dental operations are so many and so subtle that they require most careful consideration on the part of the conscientious dental operator, and the man who claims absolute permanence for his operations is one who lacks knowledge or who intentionally wishes to deceive.

In deciding on our plan of cavity preparation we must consider not only the tendency to susceptibility or immunity and the general tone of the pulp, but also the age of the patient, his general conditions, and of the mucous membrane, the sex and occupation, esthetic conditions, the shape and environment of the teeth, the habits of the patient in the care of the mouth, and various other factors perhaps, before arriving at a definite conclusion.

In regard to age, we find that very young or very old persons are more susceptible to the strain of prolonged dental operations. The general conditions would also modify our decision, since persons who are weak or anæmic, or extremely nervous, and women in the condition of pregnancy can better stand a less strenuous method of procedure. Persons having a vitiated saliva, particularly those with a thick viscid saliva and tendency to acidity, would, if other conditions were favorable, call for the more radical operation. Those presenting a tendency to inflammation or recession of the gums because of faulty contact between the teeth would also require the extension method, with marked contouring of the fillings.

Women sometimes cannot bear the more severe operations upon the teeth as well as men, and in their cases the esthetic relations of the teeth and mouth will frequently indicate less radical operations in order to prevent disfigurement. In the case of public singers and speakers we often have to consider the esthetic requirements and avoid extensive operations if possible. Apparent susceptibility would indicate the necessity for the more radical operations, while apparent immunity would indicate less radical methods, especially if other conditions were present which would seem to contra-indicate the more severe operations. In teeth with broad contact points cavities require greater extension than in those of the bell-crown shape, while in teeth standing alone (that is, having no adjoining tooth in close contact) little extension is required unless the vacant space is large enough to be filled with an artificial tooth.

With a person who is cleanly in his habits and takes extra good care of his teeth, we may take greater chances in conserving tooth structure and avoiding extreme extension, than in those who are less careful in their habits.

Nevertheless, we must keep in mind the ideal to be desired, and endeavor to approach that ideal as closely as possible, invariably extending our cavities to the proper form of permanency, provided such extension will involve little extra cutting, or little extra suffering or disfigurement.

CONTOUR AND CONTACT POINTS OF FILLINGS

I am inclined to believe that many operators are too radical in endeavoring to attain that which they consider the ideal point of contact, their idea being to minimize the amount of contact with the adjoining tooth and thereby increase the amount of so-called "self-cleansing" surface in the interproximate space. I consider it better practice to imitate nature in our restoration of contour, especially in the case of proximate fillings in bicuspids and molars. If you examine the normal arrangement of those teeth in the arch, you will find that from occlusal to gingival the contact is slight, and involves but a small area of surface in that direction, but from the facial (or buccal) to lingual, the area of contact, or (to be more accurate) of "close approach," is much greater. If we endeavor to imitate the normal contact of these teeth I believe we will secure more ideal conditions than if we attempt to make the contact area small in both directions, for while there might be less tendency to accumulation of food in the interproximate space and less shelter for micro-organisms in the case of narrow bucco-lingual contact, we do not get the same amount of protection for the gum tissue in that space as when we follow the plan of nature.

INLAYS

A paper of this nature would be incomplete without reference to the use of inlays. A few years ago the advent of the electric furnace and the Jenkin's low-fusing porcelain, together with the simplification of methods, caused a great revival of interest in porcelain inlay work, and at that time porcelain inlays were extensively used, quite often in fact, in locations where other materials would have answered better. Today the porcelain inlay is overshadowed by the gold inlay and porcelain is used too little. The newly discovered silicate cements also have something to do with the diminished use of porcelain; but since these cements are uncertain so far as durability and retention of color are concerned, the conservative dentist uses them sparingly. At the present, gold inlays seem to be the dentist's latest fad, and there are many who go to extremes in their use. Some operators even claim that they have cast aside their gold pluggers entirely, and use gold inlays in all cavities in which they formerly would have used a gold foil filling.

Let us hope that someone may preach to those men the doctrine of conservatism so eloquently or convincingly that they may be led to see the error of their ways and may become more eclectic in practice. I consider it entirely too radical to discard our gold pluggers in favor of the inlay method.

PULP CONSERVATION

The majority of dental operators have, I believe, too little respect for the dental pulp. They seem to think it has outlived its usefulness as soon as the tooth is fully calcified, and have no compunctions about destroying it. I consider the pulp a useful member, even when considerably reduced in size, because of secondary dentin formation. I believe it still plays an important part in the nourishment of the tooth, but even granting that it does not do so, I would still advocate its retention wherever possible, for many reasons. The color of the tooth is usually impaired by devitalization. The possibility of finding constricted or tortuous canals, an unusual number of canals, branching canals, two or more apical foramina in a single root, incomplete calcification of a root, calcification of the pulp, the difficulty of maintaining asepsis in some cases, the possibility of fracturing delicate instruments in tortuous or constricted canals with incomplete removal of the pulp and the ever-present danger of infection, would deter me from destroying a pulp for any reason other than a most imperative one.

I am not a believer in the apparently common practice of destroying the pulps of *all* teeth which are to be fitted with gold crowns or caps. There are many cases where we can get a sufficiently accurate fit without removing enough tooth structure to endanger the vitality of the pulp. I must confess I often place a poorly fitting cap over a tooth, or cover only so much of the tooth as can be accurately fitted without excessive trimming, rather than to destroy the pulp in order to permit the removal of sufficient tooth structure to get ideal walls. Apparently this is not considered orthodox at the present time, but I cannot get rid of the impression that in the long run the conservatism of the vitality of the pulp will be productive of the best results.

ANTISEPSIS

In a paper read in January, 1912, at the annual meeting of the Second District Dental Society of New York, Doctor Black states that we must be conservative in the use of antiseptics and germicides. His statements almost savor of radicalism, since he claims that in the treatment of the mouth we should protect and maintain the normal defensive power of the tissues as completely as possible, using no drugs that tend to lower this power. He says: "It is even better to discard drugs entirely and depend directly upon extreme cleanliness, stopping short of injury, as the most efficient aid." I am not prepared to indorse Doctor Black's views on this subject *in toto*, but I can unhesitatingly indorse his statement that "over and over again, especially in diseases of the peridental membranes, the tissues are dosed with germicides used as antiseptics until their power of recuperation has been rendered nil, and a condition induced locally from which the tissues will recover tone and active energy only after a long period of kindly treatment." This leads us to the phase of materia medica.

"O, St. Apollonia, I stand here as a poor sinner whose teeth are full of pain. Be reconciled and give me rest in my bones, that I may forget the ache in my teeth. Amen."

"I greet thee, new moon;
For the pain and the gout
And for the three little worms
Which are in my teeth;
One grey, one blue, and one red,
I wish that all three now were dead."

These are translations of a few examples of the prayers or incantations used in the Dark Ages, sometimes alone, sometimes accompanied by strange remedies, for the new moon and another to St. Apollonia, the patron saint of dentistry, who was canonized in Rome in A.D. 300. Numerous and terrible were the remedies recommended for dental disorders in the early ages, and these remedies were administered internally or applied locally, frequently accompanied by prayers to some favorite deity or saint.

The use of oil of cloves as a remedy for the toothache is prehistoric, and this has been one of the simpler and certainly one of the most efficient of the many otherwise ridiculous concoctions recommended. In Pliny's writings will be found the following: "If one wishes to be free from the toothache, one should eat a whole mouse twice a month." Myrrh has been used as a mouth preparation from the earliest times, both as a wash and as a component of mouth pastilles. "How do I explain it that your kisses smell after myrrh?" "That the breath of your mouth may not smell from yesterday's wine, Frescenia. You use Cosmus' mouth pastilles." Both of these quotations are from the epigrams of Martialis.

From such remedies as hyssop, licorice, dog's milk, goat's butter and other materials of even stranger origin, many vile substances were prepared. There is recorded on a clay tablet found in Nippur by archæologists what is probably the oldest dental prescription. The age of this tablet has been placed at 2250 B.C. In an early Cymbric manuscript may be found the following: "How to extract a tooth without pain: Take some newts, by some called lizards and those nasty beetles which are found in ferns in the summer time. Calcine these in an iron pot and make a powder thereof. Wet the forefinger of the right hand and insert it in the powder and apply it to the tooth frequently, refraining from spitting it off, when the tooth will fall away without pain. It is proven!" In the Middle Ages prescriptions were frequently of a complex nature. In the works of Fallopius, who lived 1523-62 A.D., are found many examples of this one formula written by him containing 32 different ingredients. Even in the past century this tendency to what is called "gun-shot" prescription writing was markedly prevalent, the idea evidently being that if one drug did not hit the mark another might possibly do so.

All of this was, of course, the rankest empiricism. It is only in the last decade that the profession of dentistry has made any marked progress toward the rational use of drugs and other remedies in the treatment of pathological oral conditions. We have been wandering in the dark because we knew very little about the causes and the pathology of the conditions we were endeavoring to treat, with the result that our remedies could not be intelligently and rationally applied. We have been progressing in this direction in the same pace as have other subdivisions of the great art of healing.

We have been too much absorbed in the technical side of our profession with the result that we have been frequently classed as mechanics and artisans. It is only through deeper and closer investigation along the lines of the medical side of our profession, if I may term it such, that we can expect to take the place which justly should be ours and become universally recognized as scientific and broadminded disciples of a most noble profession.

Through the efforts of such men as Burchard, Talbot, Black, Cook, Miller and others in the past, and Prinz and Buckley in recent years, we are acquiring a deeper knowledge and a more intelligent conception of the use of drugs. There is still a great field for investigation before us, and it behooves us to push forward in this direction. We are doing many things today in an empiric manner which are almost as ridiculous as the instances cited.

Many new remedies have made their way into dentistry in the past four of five years which have greatly strengthened our armamentarium. I wish to call your attention this morning to some of the new ones, and also endeavor to show that some we have been using in the past should be either entirely abandoned or their use restricted. In doing so I shall endeavor to give my reasons for the statements I shall make and the treatments I shall advocate:

SILVER NITRATE

The first drug to which I wish to call your attention is silver nitrate. This drug has been largely advocated in the past as a treatment for hypersensitivity at the necks of the teeth, for erosion and abrasion and for caries in children's teeth. It has been used either in the form of the stick of lunar-caustic or of mitigated-caustic for cauterizing the necks of teeth. Another method has been to dip a silver wire in nitric acid solution, thus producing a deposition of silver nitrate at the end of the wire, which was touched to the desired spot; or a piece of asbestos or blotting paper, soaked in silver nitrate solution, has been placed in the bottom of a sensitive cavity and permanently sealed in position. Now, silver nitrate, when exposed to light, turns dark, and when brought in contact with albuminous material produces a dark coagulum which rapidly turns black on exposure.

This being the case, silver nitrate should never be used in the mouths for the purposes mentioned, as there are other caustics which act as rapidly and efficiently, and even more so, than does this drug. As a substitute we have zinc chlorid, trichloracetic acid and lactic acid among the more prominent ones. The first two are quite penetrating and will do anything silver nitrate will do without staining, and more rapidly. I have had more success with zinc chlorid in 50 per cent. solution, or the deliquesced form, than either of the others. Neither of them can be brought in too close proximity to the pulp, consequently they could not be sealed in deep-seated cavities in children's teeth. At the same time, the practice of applying silver nitrate to any tooth is a pernicious one and should be abandoned.

ESSENTIAL OILS

The most prominent drugs in this class are the oil of cloves, cassia and eucalyptus. When perfectly fresh and pure they possess very little, if any, color, but with age and exposure they turn darker and undoubtedly are the cause of tooth discoloration when used in the treatment of canals. Of these, the oil of cloves possesses the greater anesthetic properties, due to the presence of a substance closely related to the modern synthetic cocain substitutes; oil of eucalyptus is the most irritating. Clove oil contains as a chemical constituent, eugenol, which gives it its antiseptic properties. Eugenol has not the tendency to discolor and stain dentin that clove oil has. The active principle of oil of cassia is cinnamic alderhyde; that of oil of eucalyptus is eucalyptol, neither of which produces discoloration of tooth structure. Many cases of pericementitis have been produced by the use of oil of eucalyptus in a root canal. I wish also to caution against the use of old and discolored solutions of phenol and creosote, which will do the same thing. Potassium permanganate has been largely used as a mouth wash in infections about the mouth. As is well known, this drug will stain anything with which it comes in contact, and its use should be abandoned.

HYDROGEN DIOXID

This drug is frequently called peroxid of hydrogen. Modern therapeutics teaches that in the removal of the pulps, either by the devitalization method or anesthetization, there are three important things to be observed, viz.: asepsis, preservation of the color of the tooth and perfectly filled canals. I wish to caution against the use of hydrogen dioxid in a canal where blood is present. It has been the custom of many operators after the removal of a live pulp to stop the bleeding and cleanse the canal with hydrogen dioxid.

This is undoubtedly the cause of discolorations occurring in the tooth structure later on. The dioxid when brought in contact with the blood unites with the iron in the hemoglobin and produces iron oxid, which by the effervescence of the gases produced in the chemical reaction is forced into the dentinal tubules, where it generally darkens and produces the discoloration. As substitutes I would recommend either alcohol or distilled water.

TINCTURE OF IODIN AND ACONITE

This combination has long been in use for the relief of inflammation in its early stages, particularly in dentistry as a local application in the treatment of pericementitis. Tincture of iodin is applied to the gum as a counter-irritant, with the idea that it will draw to the surface some of the excess of blood from the engorged vessels in the inflammed area in the pericementum, which it will undoubtedly do in many instances, thus helping to abort an abscess in its early stages. Tincture of aconite is an arterial sedative and its action, when applied locally, lessens the supply of blood in the vessels of the part to which it is applied. Now the tincture of iodin is supposed to produce an increase of blood in the superficial tissues by withdrawing it from the deeper tissues, consequently the two drugs are counteracting each other and should not be used in combination.

COCAIN AND ADRENALIN CHLORID

There has been quite a discussion of late with reference to the use of this combination as a local anesthetic for injection and for pressure anesthesia. In the first place, in my opinion, cocain is a dangerous drug to use even in a root canal, on account of the possibility of absorption and the production of poisoning in patients presenting an idiosyncrasy. The adrenalin chlorid is introduced with the idea that on account of its strongly astringent properties it will so constrict the vessels that the danger from absorption of the cocain will be lessened. This theory is undoubtedly true and the combination is an effective one where cocain is used hypodermatically.

When the operation of pressure anesthesia is performed, the blood is driven out of the pulp tissue into the apical space and after removal of the pulp there should be a certain amount of bleeding to relieve the apical engorgement, otherwise a sore tooth is necessarily the outcome. Adrenalin chlorid prevents this very desirable bleeding and consequently should not be used. In addition, after its astringent effect has worn off, a secondary hemorrhage is likely to occur, possibly after the canal has been filled, with resultant trouble.

The most prominent substitute for cocain before the profession today is novocain, a synthetic product which pharmacologic experiments have proven to be seven times less toxic than cocain with the same anesthetic properties.

I should like to mention other irrational things I believe we are doing with drugs, but time will not permit.

An increased knowledge of the etiology and pathology of diseased processes with a closer study of physiological and chemical action of drugs will produce many advances in therapeutics in the next few years. We are now really just entering this great field of research and it behooves each of us to keep abreast of the times, and to contribute our mite toward the advancement of knowledge in this direction.

Finally, gentlemen, are we ever conservative or radical with our ideals; more particularly with our ideal of success? With not a little hesitation I address you on the great question of what constitutes success in our professional life. This, of course, is the most serious problem which the thinking man has to face, and so it is the first business of any intelligent man to determine for what good he is striving. Because, therefore, of the primal importance of this question to all men it has, in its broadest or largest aspect, earnestly engaged the greatest minds of every age—philosophers, poets, teachers, political, social and religious reformers—all have given notable answers to this fundamental question, "What is it that is really worth striving for?" And if perhaps my endeavor to discuss this phase of our problem seems presumptuous, remember that I am only trying to say again what wise and great men have already said many times. You see, therefore, that the subject is almost as old as time itself. But such a problem as this constantly occurs; any ideal that is really worthy must needs be reiterated constantly, and preached with the utmost emphasis before even a few men can be made to hearken and act thereon.

What, then, shall be considered success in professional life? In this day of strife, in this day of commercial activity, which we are pleased to call civilization, many men show by their efforts to accumulate fortunes that wealth is for them the chief object of attainment.

Not in our profession merely, but also in law and medicine, is the estimation of a man's success calculated in terms of his material possessions. The degree of success, according to this standard, is in direct ratio with the number of dollars which the individual owns.

This same spirit has permeated the ranks of our profession, for how often do we hear of one of our confreres heralded as great, for the reason that for his services he received five, ten, perhaps fifteen dollars an hour. Wealth, gentlemen, is not true success; it is only a means, not an end, and if we measure success by money, in order to be consistent, we must concede that the charlatan or advertising man who is a recognized menace to all progress, is a successful man, since he gets more money in a given time than many of his ethical brethren.

The world is expressing a true and ultimate judgment upon the lives of men who have passed away. The world is also placing its seal of condemnation upon all efforts whose inspiration is merely wealth. The jingling of gold or silver has not the true ring of success. It is simply a discordant noise which the happy miser in his narrow mind, mistakes for music.

> "Gold, gold, thy clear and echoing sound
> Hath through the ages rung thy knell of death and woe,
> And Labor's toiling thousands have been ground beneath thy tyrant heel.
> Noble purpose; high ideals,
> That reach to Heaven's vaunted blue,
> Hath thy dread power laid low.
> What is there in this metal, hard and cold,
> That sweating, struggling millions strive to win?"

We speak of the glory which is Greece, and the grandeur which is Rome, but in vain do we seek for the name of the wealthy Greek and Roman.

On the other hand, who were Socrates, Plato, Aesculapius, Ptolemy Alexander, Hippocrates, Cicero, Celsus, St. Francis, St. Vincent de Paul, and Lister, and Liebig and Ambroise Pare? Immediately you will reply, they are the heroes and saints and men of genius, whose names are writ large upon the scroll of time, and whose memories shall be as sweet perfume in the years to come; yet not one of wealth. What, then, are their claims to greatness?

You all know, gentlemen, that Hippocrates was the greatest physician of ancient Greece, and that he expressed views relative to the teeth, centuries before the circulation of the blood was ever dreamed of, which, after two thousand, four hundred years of study, are found to be absolutely correct. You know, also that Celsus was a Roman, probably a physician, who wrote a book, "The Medicine," which embraced all the views of the Alexandrian anatomists; and that Ptolemy Alexander was one of the men who caused the establishment of the Alexandrian University, the only perfect university which the world has ever known. You would tell me that Socrates went barefoot preaching to the Athenian dandies; that Liebig, the master of agricultural chemistry, the man who had reached that degree of perfection that seems almost impossible for any one man to reach in a lifetime, just before his death said: "If only I had the power to work as of old, I would be happy;" that Lister solved many of the problems of diseases; and so on and on I might go, only to show that it was the profound reasonings of Plato, the medical skill of Aesculapius, the philanthropic depths of Socrates, the moral simplicity and grandeur of St. Francis, and the fiery eloquence of Cicero. These are the things that have rendered them immortal, and everything which I have mentioned, gentlemen, is in some sense the realization of an ideal.

Is skill to be desired for its own sake? A career that holds this ambition as its beacon light is not only disappointing but is fordoomed to failure and disallusion; for however great the perfection to which we attain in our chosen field, none the less are we but the narrow specialists, since we lack that largeness, that openness and flexibility of mind, which only a wider knowledge brings.

A botanist may, with the greatest ease, differentiate the minutest details of every flower in the garden; an anthropologist may, with recovered bones, reconstruct forms that existed thousands of years ago; an astronomer may tell you how long it would take on an aerial railway to reach the man in the moon; a microscopist may discourse upon the number of microorganisms that may be placed on the point of a needle; a pathologist may tell you, after an examination of a section of tissue, whether or not such tissues will destroy life. Yet none of these men can claim greatness if his possessions consist of these capabilities alone.

A genius is not necessarily a great man. He may be a Beethoven in the creation of sweet tones; a Raphael in the superior handling of the brush or pencil; a Michael Angelo in the magic skill of unfolding the beautiful forms which are hidden in every piece of granite; a Napoleon in his miraculous genius for war; yet not a great man.

Honor, reputation, fame, social position, are all desirable, but they in themselves do not make nor are they evidences of success. These in life are not the goal; they rather constitute the price. Many times they may come unsought and undeserved.

What, then, do I consider to be the secret of a successful professional career? Simply this: The self-realization of an ideal; for it is our ideals that determine our thought and our actions; that keep us young, and sustain us in our hour of disappointment and trial. For, as Carlyle said: "What does it matter whether the ideal be made of this stuff or that, so long as the form we give it be heoric, be poetic?" A really successful life, then, is one which has for its stimulus *ideals*. The ideals of culture, social utility and moral rectitude are those that make for the largest success in professional life.

In order therefore, to lead a successful professional life, we must have ideals which will stimulate that desire to help a fellow creature. To do this, we must first be good citizens, thereby having a direct interest in all things which will benefit or improve the social, religious or political conditions of our times. If we wish to make dentistry in reality what it is in name, a learned profession, we must familiarize ourselves with more than science, we must familiarize ourselves, so far as we can, with art, music, and most important of all, literature. Thus may we become cultured.

I speak not for that culture which places a person upon a higher but false station; nor that culture which is used as a badge to absolve certain persons from respecting the rights of others; nor that which is transferred from one generation to another, in the form of a family tree, pedigree or title; nor that which is wrongly used to designate social exclusiveness: but that kind which has for its one object the study of perfection, or, as Matthew Arnold, its great apostle, says, that culture whose "origin" is in the love of perfection; it is a study of perfection. It moves by the force, not merely or primarily of the scientific passion for pure knowledge, but also of the moral and social passion for doing good; to render an intelligent being yet more intelligent. To make reason and the will of God prevail. Not a having and a resisting, but a growing and becoming, is the character of perfection as culture conceives it; and here, too, it coincides with religion.

And here, too, the exacting duties required of us, as professional men, prevent us from knowing each other well and that which we do know is not always truth. Therefore, the social obligations as Christ taught them are the only true ones. To love one's neighbor as one's self; to equalize one's neighbor as one's self; to elevate one's neighbor to that plane where we may regard him as our equal. On such a foundation was Christian society founded. Its age might seem to suggest its worth. While working along the narrow channels of a professional career does not in itself constitute success in life, it must be reckoned with as an etiologic factor in the attainment of a general success. Carlyle has said that the conditions which did not contain the actual for man did never exist. Our special work should be carried on, first, because we are in sympathy with and firmly believe in what we are doing; second, because we believe that we are contributing something to the happiness of the people. Let us, then, work, and as Emerson says, "Hitch our wagon to a star."

Again, we may remember the words of Carlyle: "Even though it be but the infinitesimal fraction of a product, it is the most thou hast in thee, out with it, then; in God's name, Produce."

The professional man must devote his heart and head to the lifting up of the profession till it is synonymous with law, justice and right. If we are wise, we will go over the pages of its past, picking out those, pagan and Christian, that portray its progress from the crude laws that told men to take an eye for an eye, a tooth for a tooth, and a life for a life, to that splendid manifestation of its highest attainment found in the Christian doctrine, not only of doing unto others as one would be done by, but in that higher doctrine which decrees it a duty to forgive one's enemies.

When Tribonian and the codifying committee appointed by Justinian to codify the laws of Rome, were about to begin their great epoch-making work, Justinian bade them yield to Papinian's opinion, though Gaius, Ulpian, and many others of Rome's great lawyers were on the other side.

France, on a like occasion, points to D'Aguesseau, who, when asked by a perfidious king to perjure himself, refused, and like the other, chose death rather than sacrifice his loyalty to law, justice and right.

Words are only weak instrumentalities when one wishes to say what these men's purposes were in regard to their profession.

May these same motives, these same ideals, inspire us.

Great success in life, then, is not calculated by the applause of the multitude, but is measured by the services which we have rendered to the world and to its people, and the motive which inspired them, being radical where the exigencies of the occasion require it and conservative where cautious discretion may indicate. A man whose greatness among men is inspired by unselfish motives is the truly successful man. Self-knowledge, self-reverence, self-conduct, these alone should lead life to sovereign power; and yet, as Tennyson says, "But not for power; power of itself would come uncalled for; but to live the law, acting the law we live by without fear, and because right is right, to follow right were wisdom in the scorn of the consequence."

DISCUSSION

Dr. S. D. Ruggles: The committee has found it wise to divide Doctor Curtiss' paper into three sections. I shall speak on the first two sections of his paper; namely, prophylaxis and cavity preparation.

The doctor said it was becoming more or less stylish among men to specialize in oral prophylaxis, and, as a matter of fact, if a man is practicing a specialty, that is, if he is treating pyorrhea and doing work in prophylaxis solely, it is a good thing. But if he is a general practitioner, it should be a part of his every-day duty to do the necessary scaling, to make the examinations of the soft tissues and become acquainted with the patient himself, and not delegate that to an assistant. One of the best procedures in general practice is that the scaling be done first. This enables you to get acquainted with your patient, and occasionally when you have a new patient it is a good way to allay fear that he may have of your inability, and at the same time will give you an opportunity to study that man's habits, to know whether or not you had better make certain suggestions as to his hygiene. It will be a very profitable hour for you to spend with this man, but don't fail to allow him to compensate you for it. It is a difficult and delicate task to properly remove calculus; don't ever think it is a one-dollar job. I don't know of any time during the operations when a patient is more receptive to suggestion than when something is going on which doesn't cause pain. I find it expedient sometimes with children to do nothing but clean their teeth and then send them home, especially the little folks.

The doctor made some reference to the part which the dental manufacturers are taking in regard to prophylaxis or oral hygiene movement. I want to give the manufacturers their just dues for the great deal they have done. They have supplied us with many of the useful things; they have been very free in advertising such necessary operations, and have even gone to the expense of publishing a journal gratis for the dental profession. I am rather inclined to think that some of this may not be altruistic, for these papers are careful to publish nothing of a nature which will discredit the preparations advertised in that organ. It is a well-known fact among all practitioners of dentistry that the indiscriminate use of antiseptics, peroxid of hydrogen, etc., is not a good thing. The mouth does not need to be dosed every time you go into the bathroom any more than your ears or nose need to be sterilized or your intestinal tract doped. While some habits are good, there are some that are injurious, as the doctor has said, and as Doctor Black said in his article on antiseptics published a while ago.

In cavity preparation every rule has its exception. The doctor has given us a very good outline of Black's method of procedure, but I want to add one or two things. The best fillings made, with either a tin margin or a soft foil margin, that is, a non-cohesive· will fail unless you have perfect coaptation. The success of a filling depends not so much upon the condensation of the filling as upon whether or not that filling protects the septal tissues in the interproximal space. Within the first forty years of our life the proximal contacts from one third molar to another are reduced by wear to the extent of one-third of an inch. Let us not forget that when a proximal contact is made it is well to overdo it rather than underdo it, in order to compensate for the wear on other contact points. The doctor seems to take issue on the marble contact talked about so much by Doctor Black, and says it should be broader from buccal-lingually than from the occlusal toward the gingival. As a matter of fact, we find our best formed interproximal spaces between the teeth which are bell-crowned; you will notice the bell-crowned teeth are the ones which call for less filling on proximal surfaces than the ones with nearly parallel walls. The contact point serves one purpose only, which is to protect the interseptal tissue, and it should be a marble contact. If the contact point is placed too high, it is injurious; if too low, it is injurious. The marginal ridge of a filling is almost as important as the contact point. If the contact is made in the marble-like form, and the space getween the adjoining teeth, which is ordinarily filled with interseptal tissue, is not a V-shape, but a cone with convex sides, whatever may slip between the contact point will be very readily removed by the food slipping through the embrasure the next time; but if just broad enough to let something through and the space V-shaped be especially narrow, it is difficult to dislodge what gets into that space and it injures the interseptal tissue.

The inlay question is a big question. There is no more difference in the preparation of an inlay form than in the ordinary filling of the Black method, excepting the undercuts are entirely done away with. The inlay enthusiast who has thrown away his pluggers had better get them out. You have frequently heard men say that nothing but a large cavity would appeal to them for an inlay, to which I agree, and I would rather have a good amalgam filling with good margins than a poor inlay with questionable margins.

Dr. H. E. Germann: I deeply appreciate the privilege of discussing a paper so replete with food for thought. I will not discuss this paper paragraph for paragraph, for in the main I thoroughly agree with the essayist.

To my way of thinking, the terms "radical" and "conservative," with few exceptions, do not mean much in dentistry; for the radical treatment of today may become the conservative treatment of tomorrow, and vice versa, as a result of constant research and observation.

A treatment is radical to the extent to which it is carried on after its failure has been proven. Likewise any treatment is conservative until it is proven radical. Thus a treatment is conservatively right or radically wrong.

For instance, vaccine therapy is a radical procedure unless the individual applying the same is thoroughly familiar with the fundamental and basic principles involved in its make and administration; having a complete history of the case pertaining to the blood and circulatory system, renal conditions; knowing when to give it and when not to give it. Then does it become conservative medicine and then only should it be used by the dentist or the physician.

Again, a patient may present himself, with a case of rheumatic arthritis with its attendant symptoms. After a careful examination into the history of the case, the X-ray offers convincing evidence that several foci of infection around the apices of roots offer themselves as the exciting cause.

One man would say that amputation of the root ends would be a conservative procedure, and still another would say that the extraction of the teeth would be the conservative operation; whereas either of them, if successfully done, would cure the rheumatic arthritis. There again it might be necessary to resort to the vaccine therapy.

After all, the temperament of the patient, the previous history of the case, sociological standing—the condition of the balance of the denture, the skill of the operator and various other causes determine the classification.

And so, extension for prevention, the restoration of contour and contact points, making of inlays, root canal treatment and filling, nitrous oxid and oxygen analgesia; the use of medicaments; the use of sharp planes and scalers on exposed cementum during prophylaxis work; the proper use of intermediates must be studied and thoroughly understood to enable us to use and do them conservatively.

Even the silicates, which are deemed unreliable by the essayist, can be used as a conservative filling material if the condition of the saliva is taken into consideration, and the cement mixed at the proper temperature and under favorable atmospheric conditions, and the filling finished properly.

The various makes differ and must be studied and understood to be used conservatively.

Although I make few gold crowns, I would not place a poorly fitting shell or partial shell over a tooth; for by either conductive anesthesia or nitrous oxid and oxygen analgesia and careful grinding with a cool stone, we can accomplish the desired tooth preparation to make a perfectly fitting crown and by contouring the crown sufficiently to allow for a good heavy cement body as an intermediate, we overcome the dangers of thermal shock.

To many of our prominent men, the devitalization of all teeth which are to carry crowns and large metallic restorations is a conservative operation. The dreadful story that is told by our friend the X-ray, even when teeth have been conscientiously filled, to say nothing of those filled with conglomerated compounds of hidden foci around the apices of the teeth, of teeth filled with compounds of irritant drugs, makes me feel that such is a radical operation. Eliminate the hobbies and you do away with radicalism.

When I read about the findings of those men, who are giving up their time to the study of oral infection and its ravaging work of producing lesions in other parts of the body, I wish that I should never again see an exposed pulp, that I might Rip Van Winkle it until such a time when the public will have been educated and there will be nothing for dentists to do but lecture to the children in the schools on the "Care of the Mouth."

I thoroughly agree with the essayist in that I do not wish to disturb a healthy pulp unless positively necessary; for in conscientious and painstaking treatment of root canals of bicuspids and molars, one can in several hours use up enough nerve energy, physical endurance and patience to last for a day of ordinary dental work.

There is one thing in particular which it will be imperative for the members of our profession to do for its conservation and advancement: Gentlemen, has it ever occurred to you since you left college that we shoulder a great responsibility in the pursuit of our profession, even greater than that of our medical brethren? If not, it is because you have not given the matter serious thought, for we must not only be accomplished in prosthesis, but we must know the fundamentals of medicine as well.

And it is only by thorough study, constant observation, conscientious application of our time to our work that we can improve and increase our knowledge, to the extent of which we can command the confidence and respect of our medical brethren.

With the rapidly increasing ailments (as proven by our researches) attributed to mouth infections, it is only natural that we shall be called into consultation more frequently with the medical practitioner.

Now how can we command the respect and confidence of a physician if we are called into consultation unless we know something about the scientific branch of our profession?

We might talk to him until black in the face about extension for prevention, approximal contact, occlusal contact and what not, using a varied amount of dental phraseology and he would turn a deaf ear, but let us talk to him knowingly about dietetics, blood analysis, blood pressure and things pertaining to medicine, and what is the result? If he is a well posted physician, he will say, "That chap is well posted and knows something," and if the physician himself knows nothing he will not say much, but he will think that we know it all; and it will be easier sailing from then on. Then again, it is a matter of self-preservation and he will not be able to hide behind our shortcomings, and we will be able to cope with any oral lesson conservatively.

We are spending our time and contributing our moneys to research work, and why not? Are we not receiving in return many times what we are putting into it? And still many of us do not place a legitimate value upon our service. Every individual can and will pay for a service which will give him health. Health is worth more to him than a lot of crowns, bridges, combination inlay and silicate fillings and the like, and it is our duty to advise him of this fact.

It is next to criminal to place a lot of fancy dental work and leave a mouth full of foci of infection; thereby subjecting the patient to a condition far more serious than a diminished beauty, or lessened masticatory surface.

If I had never had any dental work done and I had $50.00 to spend on my mouth, if necessary, I would rather spend it for X-rays, prophylaxis, plastic fillings, than I would for a half dozen beautiful gold inlays.

The fact of the matter is, our patients are becoming better educated in health movements and the time is rapidly approaching when they will expect us to be better qualified to collect fees for what we know and not for the amount of gold, amalgam or rubber we sell them.

In the closing remarks of his paper, our essayist has in a most beautiful discourse shown us the light, and such influence should elevate our ideals to the highest possible standard, for by so doing we will be placed at the head of the procession of those who are laboring for the good of mankind.

Dr. H. T. Smith: In the discussion of this excellent paper, Doctor Ruggles told me he would cover the portions on prophylaxis and cavity preparation. This does not leave a great amount of tangible material for discussion; so I will give you only a few philosophic observations on a comparison of the *conservative* mental process with that of the *radical.*

When Doctor Curtiss defines conservatism and radicalism, he is defining a state of mind. Either may be an inherited tendency. A man is usually conservative because his father showed that characteristic, and perhaps his grandfather, and to a certain extent he can *not* change that basal mental tendency. But we all recognize the modifying influences of environment, association and education. And so I believe that a young surgeon with conservative tendencies, by constant association with a bold, radical, reckless operator as preceptor, might be led into the older man's methods of thinking and operating until it became a fixed habit, and so with a dentist. Also, I believe, an observing man may often, from the mere appearance of a dentist, form a fair estimate of his mental processes and his way of looking at things.

When you apply these observations to dental practice you find, as a rule, the conservative man is the safe practitioner, into whose hands you would put your own mouth or the treatment of your own family. And this, by the way, is the best test you can apply as to the real estimate of a man's ability. The danger with the conservative dentist is that he will become ultra-conservative as he grows older, ignoring new and excellent methods or adopting them too tardily. Sometimes he is not honest, preferring to appropriate the work of the venturesome radical without giving him credit for his efforts and the sacrifices that he makes, even convincing himself that he has initiated the new method, when in fact he has only appropriated or adopted it.

Fortunately, the radical dentist cannot do very great harm in the mouth, since his operations are constructive rather than destructive, as are the surgeon's operations. This is especially true in medicinal dental therapeutics, where corrections may be made by a change in treatment or even the reconstruction of a faulty filling or appliance. At other times, of course, the damage done is irreparable, even in the mouth.

Doctor Curtiss makes a plea, however, for a nice combination of the conservative and radical in the dentist's makeup. Here we would have the ideal, so far as results are concerned. But how few are they, as Doctor Curtiss says, and how unappreciated oftentimes.

In any community you can almost number them on the fingers of your hand, and you will not use many fingers, either, after reserving the first finger, of course, for yourself.

I call to mind a number of these fine men in the history of this society; so do you all. But I will name you just one, long since gathered to his fathers, a fair-minded, generous-hearted, kindly gentleman, a forceful and excellent filler of teeth, a fine plate worker, a fine diagnostician and an early investigator in diseases of the peridental membrane; not a city practitioner, leaning upon the efforts of specialists about him, but independent, conservative, investigating, generous with his time and money, at a period when both were needed by the profession in Ohio—I name him as a type: Dr. F. H. Rehwinkel, of Chillicothe.

I know another whom it would be only fair to mention; enough like him to be a brother; whose efforts we inherit today. I refer to George W. Keely, of Oxford.

Doctor Davenport once said, "That man is the best dentist who, as he grows old in practice, can show in the mouths of his patients, the upper bicuspids uncrowned and performing their functions."

The ultra-radical dentist cannot exhibit these teeth. While pursuing some will-o-the-wisp of an appliance or new method, he forgets the inherent weakness of this tooth, architecturally, the immense occlusal force it must withstand, the liability of its gingivæ to injury and resulting infection, or with the appearance of a small cavity, he rips its weak, bell-shaped walls to pieces to place a huge gold inlay, larger in volume than the tooth tissue he has left. The small pulp is shocked to death, a leak occurs somewhere, the pulp is infected. With the wearing of the neighboring teeth, the big inlay has assumed a plus occlusion, which he does not recognize, and the pericementum is jammed until it takes on a chronic inflammation; or the lingual cusp fractures below the gingivæ, he tries some new crowning device. It doesn't work, so he tries another; the bicuspid becomes a lame, crippled member and a nuisance to its owner. Out it comes and a similar cycle of events is begun with a bridge. This is a lugubrious, extreme clinical picture I have drawn, but it happens to some upper bicuspids. But whether it happens or not, I believe that Doctor Davenport's remark represents the result of conservative operations.

I have tried to put before you in these few sentences Doctor Curtiss' ideal: the man his mental processes and his operation.

Doctor Curtiss (closing): Doctor Ruggles spoke about the manufacturers, but I hadn't them in mind. My statements might be so construed, but I had reference in particular to those who have taken up prophylaxis alone, for mere aggrandizement to the detriment of the patient and the profession as well. The specialization in it, I am convinced, is not of probable good to our science and work, unless it is taken in conjunction with pyorrhea. The beautiful clinic we had upstairs this morning by Dcotor Hayden demonstrates that emphatically. As to the bell-crowned tooth, if you will look into the natural arch and see that lymphatic type, with a buccal-lingual expanse of contact, and the beautiful condition of those gums, and you will even find them in mouths where they have chewed tobacco so they are worn down, but the gums are not infringed upon, but are healthy and firm and do not have pyorrhea; you fill that tooth with spheroidal point of contact, and the gum is inflamed and there is trouble there, and the radiograph, mentioned by Doctor Germann, tells the story. The lack of sufficient contact bucco-lingually is the sole trouble, otherwise it is beautiful work. In the bell-shaped crown you can readily see how you want, as he calls it, the marble point; you have greater gum tissue in the inter-proximal space.

The radiograph as to the crown: The radiograph in our work is only in its infancy, and now is the time we are apt to be radical. I am glad to note in this session of the society a conservative tendency; but we are apt to be radical, and we may find now, while it is in its experimental stage, a great per cent. of the trouble at the end of the roots will be due to nerves dying under crowns when he have used the nitrous oxid or the conductive method of anesthesia, because a person isn't able to tell you. One of the greatest things the

Almighty Creator gave to the human family is pain; one of the greatest assets in diagnosis is pain. The Almighty gave it to us, and that is the way he tells us certain things. If we do not use that asset, we shall have trouble at the ends of our roots. I mean the artificial crown, made over the crown of a tooth, where you don't get all the enamel off, because if we did you would cut the beveled walls; you would have to take so much dentin off that in some teeth you would get so close to the nerve you would have a beautiful picture in the radiograph, and then have a case of extraction or treatment. So I would rather put on an ill-fitting crown, or so much of the tooth crown covered as to insure stability of the crown and not to touch the gum.

Doctor Smith hints on heredity; on eugenics. That is a hobby with me, and I am convinced, while heredity and eugenics have considerable to do, that there is something within us which the professional side as depicted by Doctor Thompson will eliminate, and will get us to put the sound reasoning of our intellect to the case that presents itself, and then we will have no trouble with heredity. The trouble is that most of us do not have the preparation suggested by Doctor Thompson. I want to thank the discussers of this paper for the leniency with which they have treated this, my maiden effort.

LOCAL ANESTHESIA*

BY STEPHEN P. MALLETT, D.M.D., BOSTON, MASS.

WE ARE LIVING IN A PERIOD in which the demand for relief from pain is general. Coupled with this is a wide-spread understanding of cause and effect in relation to bodily welfare. Newspapers, magazines, and public lectures all contribute their share to the knowledge of the public, with the result that we, as dentists, must of necessity do our utmost in eliminating pain from dental operations; for only by eliminating pain can the most efficient service be rendered.

There have been attempts along a number of lines to reach this ideal state. General anesthetics have been administered, the patient being carried to the primary or analgesic stage for ordinary dental operations and to deep anesthesia for surgical work. This is a practical and widely used method, but it is open to objection on account of its complicated apparatus and the necessity, or at least desirability, of having an assistant to administer the anesthetic and watch the patient. Nitrous oxid and oxygen is the most common agent, but somnoform is also used.

We have anodynes of which Buckley's desensitizing paste is the most used. When it first was placed on the market it seemed that the dental millennium had at last been reached, for all cases were supposed to yield to its magic qualities. It has been in use too short a time for one to give a definite opinion as to its value, but judging from my own experience and that of my friends, it can be used successfully only in shallow cavities. In many cases toothache with consequent death of the pulp has followed its use in deep cavities. This may have been due to our faulty technic, but with our present knowledge its record of failures under certain conditions, plus the inconvenient twenty-four to forty-eight hour interval between the application and the dental operation, makes it fall short of acceptance for universal use.

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*Read before the Vermont State Dental Society, 1915.

We are indebted to W. H. Fitzgerald, M.D., of Hartford, Conn., for an ingenious method of producing surgical anesthesia. He has charted the body in zones and areas, where pressure, just short of pain, applied for a moment or two will produce anesthesia in some definite but remote part of the body. To illustrate: pressure on the joints in the fingers or toes will induce an anesthetic state in certain teeth. As yet this method is very much in the embryonic state, but it is well to bear it in mind as a possibility for the future.

ETHYL CHLORID

Today the number of cases where ethyl chlorid is helpful is very small. The extreme care required in applying it, the limited places in which it can be used, and the liability of intense pain produced by extreme cold prohibit its use.

We now come to local anesthesia produced by hypodermic injection. It would surprise many of us to know that experiments along these lines were conducted as early as 1853. They were for the most part unsatisfactory, but culminated in Koller's demonstration of the anesthetic properties of cocain in 1884. In 1885 conductive anesthesia was first employed by Halstedt, who injected in the vicinity of the inferior dental nerve, rather than in the immediate vicinity of the tooth.

Braun, to whom the title of "Father of Modern Anesthesia" is applied, made the suggestion of the addition of the extract of the suprarenal capsule to the injecting solution.

Novocain, discovered by Prof. Einhorn, of Munich, fulfills the requirements of a safe and effective anesthetic, inasmuch as under satisfactory conditions it will permit the most delicate operations to be performed in peace and quiet, with very little hemorrhage and without haste or interruption.

NOVOCAIN

Novocain, which is seven times less toxic than cocain, occurs in small, colorless and tasteless crystals, is soluble in water and less so in alcohol. It can be heated to 120 degrees Centigrade without decomposing. It produces the general alkaloid reactions and has the same effect on the peripheral sensory nerves as cocain. Novocain creates no irritating effect upon the most sensitive tissues even when applied in strongly concentrated solutions, and no systemic effects are perceptible. It does not even affect the respiration, circulation or cardiac function.

The two per cent. solution is the best for both infiltration and conductive anesthesia. With few exceptions even in cases of anemia, neurasthenia, nephritis, arterio-sclerosis, heart diseases, or in cases of general weakness is it found necessary to weaken the solution. The maximal dose is 0.5 grams, for subcutaneous injections, but as much as 2 grams has been used subcutaneously with no bad results. The maximal dose of 24 c.c. or 12 syringes full of a 2 per cent. solution in dentistry is more than is ever called for.

SUPRARENIN

Suprarenin has great anemia-producing power and is a strong astringent. It is used with novocain to contract the capillaries and tissue locally, to prevent absorption and infiltration into the soft tissues, thereby strengthening the anesthesia, and also to decrease bleeding in certain operations. It is more stable, keeps better, and is less toxic than any of the other anemia-producing substances. It is easily decomposed by free alkali, air and heat. It is the strongest hemostatic and astringent known. For general use a solution containing 0.000,015-0.000,02 grams of synthetic suprarenin to 1 c.c., or a 0.0015-0.002 per cent. solution is the best.

Therefore the combination of novocain-suprarenin fulfills the five essentials that a local anesthetic should possess to be satisfactory:

1. The substitute should not be inferior to cocain in its anesthesia-producing power.
2. It should be relatively non-toxic.
3. It should have no irritating action even on the most delicate tissues.
4. It must be easy to combine with suprarenin and combined, it should not lose its anesthesia-producing power, neither should it affect the action of the suprarenin, and it should be soluble in water.
5. It must be boilable.

The novocain-suprarenin tablets are most suitable for our work. They are put up 20 in a tube and they are sterile and reliable. There are three tablets on the market useful in our work, namely: E, F and T tablets.

Novocain-suprarenin synthetic tablets "E" contain:

Novocain	0.02 gramme
Suprarenin	0.000,05 gramme

Novocain-suprarenin synthetic tablets "F" contain:

Novocain	0.05 gramme

The combined "E" and "F" tablets with 3½ c.c. of Ringer's solution yield a 2% solution.

The "T" tablets also yield a 2% solution and have the same amount of novocain and suprarenin as the combined "E" and "F" tablets.

The Ringer solution contains:

Sodium Chlorid	0.50 gramme
Calcium Chlorid	0.04 gramme
Potassium Chlorid	0.02 gramme
Aquae dest	100.00 gramme

Ten Ringer tablets to 100 c.c. of distilled water, boiled for 15 minutes, give the Ringer solution.

APPARATUS

The apparatus consists of two Fisher syringes, one mounted in a short hub with a 26 m.m. and the other in a long hub with a 42 m.m. iridio-platinum needle. It is better to use iridio-platinum needles because it simplifies matters in that they do not need to be boiled before using, can be used again, and are always mounted and ready. Sterilize iridio-platinum needles in flame. Steel needles should not be used because they break easily, oxidize, rust, and must be boiled just before using, which operation requires more time. The iridio-platinum needles can be sharpened from time to time with an engine stone. The syringes should be held on a tripod nickel-plated stand in the jar containing absolute alcohol. Two dissolving cups, one graduated to three and the other to ten c.c. should be kept sterile in absolute alcohol. The cups are made of porcelain and can be easily cleaned with dilute hydrochloric acid.

One double corked bottle for Ringer's solution.

Another jar should contain sterile distilled water to rinse syringe and boiling cup in order to rid them of alcohol.

Glass tray to keep tablets, wires, wrench, reserve needles, syringe parts and engine stone.

Care should be taken not to handle the tablets, always replacing cotton, rubber stopper and cap immediately, otherwise the drug will deteriorate because of contact with air and moisture. If solution turns pink it is contaminated and should not be used.

PREPARING THE SOLUTION

Remove syringe and cup from jar and rinse in distilled water to remove all traces of alcohol. Fill cup with Ringer's solution to mark desired. Heat solution to boiling. Add tablets and do not boil. Draw cup back and forth through flame to dissolve tablets.

For normal cases: One "T" tablet to each c.c. This gives a solution with:

Novocain	2%
Suprarenin	0.000,02 gr. to 1 c.c.

For deep anemia: one "E" tablet to each c.c. This gives a solution with:

Novocain	2%
Suprarenin	0.000,05 gr. to 1 c.c.

For abnormal cases: two "F" tablets and one "E" tablet to 6 c.c. This gives a solution with:

Novocain	2%
Suprarenin	0.000,009 gr. to 1 c.c.

Sterilize needle on syringe in the flame.

Fill syringe and avoid touching needle.

REQUIREMENTS OF A SOLUTION PREPARED FROM TABLETS

1. It should be immediately used after it has been prepared.

2. The solution should not come in contact with anything except the porcelain cup and the syringe.

It should not be left longer than absolutely necessary in the dissolving cup nor in the syringe. The solution is very sensitive, being affected and chemically changed by air, heat, light and especially alkalies.

3. The tablets should not be touched with hands or instruments, and the tube should be closed immediately after use. The tablets in tube will be changed by air, light, and moisture.

4. The tablets should be white.

5. The solution made from the tablets should be as clear as water.

PREPARATION OF THE PATIENT

The operator must inquire as to the health of the patient in order that the percentage of suprarenin may be reduced if necessary.

In a few super-sensitive cases when the needle prick is found to be exceedingly painful and annoying to the patient it is well to administer nitrous oxid and oxygen in the analgesic stage while inserting the needle. A pledget of cotton saturated with a 20% solution of novocain (made from "F" tablets) and allowed to penetrate a little into the mucous membrane for three or four minutes will also reduce the pain of injection. With a very fine, sharp needle in a small syringe one may inject a little before the regular injection. Sharp needles lessen the pain of injection.

PREPARATION OF PLACE FOR INJECTION OF NEEDLE

After placing a small napkin in the mouth about the field of operation hold lip away from area and wipe away all mucus. Then with a little cotton dipped in a solution of aconite and iodin, equal parts, or camphophenique, sterilize the part where the needle is to be inserted. This will anesthetize the area to a small degree.

ANESTHESIA OF THE MAXILLA

The neurology of the maxilla is more complicated than that of the mandible. In the spheno-maxillary fissure the maxillary nerve divides into the posterior palatal and infraorbital; the first enters the palatine canal and comes out through the larger palatine foramen, supplying the posterior part of the palate and the palatal part of the gum. The infraorbital nerve gives off two posterior alveolar branches, supplying the buccal part of the gum and the upper molars. The infraorbital proper passes along, giving off branches through the infraorbital foramen, supplying the outside of the face and the labial part of the gum; the rest passes downward along the antrum, forming a plexus supplying bicuspids and incisors. The anterior, superior alveolar branch emerges from the incisive foramen and supplies the anterior part of the palate and the palatal part of the gum.

The alveolar process of the maxilla is very porous and although the porosity differs over the different teeth, yet they are sufficient to permit the infiltration method without exception.

But one injection on the labial or buccal side is necessary for single-rooted teeth.

TECHNIC

Holding the syringe in the hand as one holds a pen and with the opening of the needle directed toward the bone, insert half way between gum and apex of root, injecting and pushing the needle along until the periosteum is reached. Then slide the needle upward along the periosteum to reach a point a little higher than the apex of root, then inject slowly and evenly. After here depositing 1-1.5 c.c. of a 2% solution either remove needle, or if the tooth is multi-rooted, slide the needle distally toward apex of distal root, thereby using same insertion, and inject. Then palatally insert needle about one-third way between the gum margin and the apex of the root and push needle along periosteum generally parallel with root until well toward apex, and inject about 0.25 c.c. of the solution.

It is well to massage freely after injecting as it will quicken the process of absorption. Anesthesia takes place in from five to eight minutes and lasts from 45 minutes to an hour.

ANESTHESIA OF THE MANDIBLE

The nerve supply of the mandible is simpler than that of the maxilla. The inferior alveolar nerve which supplies all the teeth enters the mandible through the mandibular foramen and supplies all the teeth on one side of the jaw. It anastomoses in the front with the nerve of the opposite side.

A branch is given off which emerges from the mental foramen and supplies the anterior part of the gum and the lower lip.

The inferior alveolar nerve with the artery lies before, and when entering the mandibular foramen, in the pterygo-mandibular space. This is bounded externally by the sulcis mandibularis, and internally by the internal pterygoid muscle. It is filled with connective tissue which readily absorbs a solution. The nerve lies posterior to the artery.

The lingual part of the gum and the side of the tongue are supplied by the lingual nerve. The lingual nerve first accompanies the inferior dental nerve, then passes further forward, and descends between the ramus and internal pterygoid muscle at its anterior margin. It then lies half way between the surface of the oral mucous membrane and the inferior dental nerve.

The buccinator nerve supplies the buccal part of the gum. It is also a branch of the mandibular division of the fifth cranial nerve. The bone in the mandible is much denser, the outer plate being quite thick and having few pores.

For these anatomical reasons conductive anesthesia is better adapted in the mandible.

CONDUCTIVE METHOD

A 2% solution for conductive anesthesia of the mandibular nerve is quite essential because of the large diameter of the nerve at point of injection, and therefore the necessity of a strong solution to penetrate to the center.

TECHNIC

Palpate postmolar triangle with tip of index finger of left hand and with tip of thumb of right hand, with the remaining fingers outside on cheek fixing jaw. With a long needle (42 m.m.)mounted on syringe and syringe resting on teeth of opposite side between cuspid and first bicuspid, make insertion into the mucous membrane 1 c.m. over the last molar, feeling the internal oblique line with the needle just after insertion. Then slide it a little more medially and push it inward, keeping in close contact with the ramus. This may necessitate a different direction of the syringe according to the angle of the ramus to the median line which varies. After the insertion of the needle inject a small quantity of the solution. Then slide the needle along the bone till it is inserted about its full extent, depositing from 1.5 to 2 c.c. in the pterygo-manidbular space in which the alveolar nerve and vessels lie. Anesthesia occurs in from 12 to 30 minutes and lasts one hour or more.

For purely dental operations we need only anesthesia of the nerve which supplies the teeth. If anesthesia of the molars and bicuspids on one side is desired then the mandibular injection alone is necessary. If all the teeth on one side are to be anesthetized, inject for the mandibular nerve on that side and make the mental injection on the other, because of the anastomosis of the two nerves in the median line. For anesthesia of all the lower teeth, use two injections; one over each of the mandibular foramina.

For surgical operations it is necessary to anesthetize the lingual nerve which supplies the mucous membrane lingually and the buccinator nerve, which supplies sensation in the region of the first and second molar and second bicuspid. This can be accomplished in one injection if sufficient of the solution is used. Generally it is necessary to make a separate injection for the buccinator nerve.

MENTAL INJECTION

Insert the needle into the reflexion of the mucous membrane just below the first bicuspid about half way between the gum margin and the apex of the root. Push needle downward and slightly backward along the bone for a few millimeters until about half way between the two bicuspids. Feel with finger for mental foramen and inject about 1 c.c. and massage freely.

ZYGOMATIC INJECTION

Palpate the zygomatic process of the maxilla and using a long needle, slide along, keeping close to the bone, going upward, backward and inward, depositing the solution while injecting. In this manner the two posterior superior branches are crossed by the direction of the needle and anesthetized by the solution, desensitizing the molars and sometimes the bicuspids. It is advisable to inject in two directions to reach all the superior alveolar branches., Inject 2 c.c. The buccal part of the gum is anesthetized. Anesthesia occurs in about ten minutes and lasts about one hour.

INFRAORBITAL INJECTION

Palpate the infraorbital foramen and hold finger on it. Retract the upper lip with one of the other fingers and insert the long needle into canine fossa as high as the reflexion of the mucous membrane allows, and until felt by finger to be in correct position. Inject slowly 1 c.c. and press and massage with finger to force solution through foramen. The incisors and cuspid will be anesthetized. This injection is not advisable except in cases of abscesses or extensive surgical operations.

FAILURES AND ILL EFFECTS IN LOCAL ANESTHESIA

There are failures and bad effects in all kinds of anesthesia. Local anesthesia today causes very little trouble in comparison to the failures with serious results of general and local anesthesia of past years.

There are different sorts of failures:

1. True failures and ill effects.
2. Psychological effects.
3. Ill effects due to other sources.

True failures are:

1. No, or insufficient anesthesia.
2. Undesirable symptoms during anesthesia.
3. After effect occurring.

When insufficient anesthesia is obtained the operator is often to blame. Sometimes he may fail because of insufficient knowledge of the anatomy of the part, or improper apparatus or technic, or because of inefficient drugs or possibly because of too large a percentage of suprarenin.

UNDESIRABLE SYMPTOMS DURING ANESTHESIA

Pain during injection may be caused by:

1. A solution which is too hot or too cold.
2. Antiseptic drugs added to keep solution sterile.
3. Unisotonic solution with blood.
4. Injection into abscess.

In past experience in some cases I have found the heart action increased, sweating or a queer feeling in the extremities, but since reducing the amount of suprarenin I have had no similar trouble.

In cases of fainting, tip the patient's head between his knees, give aromatic spirits of ammonia, strong black coffee, oil of camphor, or strychnine sulphate. Some of these agents should always be at hand.

Bromural is the most valuable preparation now used where sedative effects are desired. Bromural is administered in 5 to 15-gr. doses (1 to 3 tablets) regulating the dose according to the severity of the case and the vitality of the patient.

AFTER EFFECTS—OEDEMA

Oedema is a simple swelling caused by infiltration of serum.

It may be caused by solutions that are not isotonic, or by traumatism. Traumatism may be caused by inserting the needle several times, correcting one's insertion point, or by piercing a muscle. The last mentioned may cause ankylosis of the mandible and difficult deglutition.

Oedema, if not infected, *will* disappear without treatment.

Psychological effects on the patient are largely controllable by the operator. Keep the patient's mind occupied and keep unpleasant things from his vision.

ILL EFFECTS DUE TO OTHER SOURCES

Post operative pain and inflammation may occur after an operation, and may not be caused by the injection, but directly by the wound.

Causes may be:

1. Septic wound.
2. Wound infected during operation.
3. Wound infected after operation by fluid of oral cavity.

Trigemin, asperin, or pyramidon are useful to counteract pain originating from injections.

Novocain is useful in many of our most troublesome dental operations, such as cavity preparations, removal of normal and calcified pulps, pulp stones, inflamed pulps, abscess treatment and also in diagnosis. It is widely used now in crown and bridge work for fitting bands, cementing bridges, grinding and devitalizing.

Extracting is made easier and root amputations, impacted teeth operations, treatment of fractures, and removal of cysts, tumors and necrosed tissue may be accomplished under perfect conditions.

I strongly advise the use of the X-ray in connection with diagnosis. With the X-ray and infiltration anesthesia cases heretofore unattempted may be easily undertaken.

I have by no means exhausted the knowledge of today in regard to the novocain-suprarenin combination, but this I would like to say, that by reading the publications of Braun, Bier, Fisher, Thoma and others, sufficient information can be obtained to make dental operations for patient and operator more easily and satisfactorily accomplished.

Although the use of novocain is still in its infancy, yet by strict adherence to our present knowledge and close observation, we shall in time be able to render better service to our patients in this way than in any other.

235 Marlboro St.

WHAT SCIENCE REVEALS

BY H. E. BLILER, D.D.S., CHICAGO, ILL.

OUR PRESENT KNOWLEDGE of intestinal putrefactive processes and their related metabolic perversions, which are commonly manifested by toxemias of various degrees of intensity, is such that we no longer regard constipation as other than a condition worthy of the most skillful and painstaking treatment. We know that a stagnated colon bears a casual relation to a great variety of anomalies of metabolism; that it is a prolific source of functional disturbances.

There can be no gainsaying the fact that much of the confusion concerning the morbid phenomena brought about by the toxic products of metabolism is due to the widespread currency of conflicting theories and the ambiguity of those responsible for their promulgation. A more general and perfect understanding of the condition commonly designated auto-intoxication would now obtain, had there been less theorizing and verbosity on the part of those who have attended to the subject. An unwarranted amount of perplexity concerning the morbid processes induced by the poisonous products of metabolism has resulted from the too hasty acceptance of unsound theories and a too generous use of indefinite terms; the literature on the subject of auto-intoxication has been weakened through the introduction of defective speculation and verbal diluents.

Systemic hygiene, and diet prevention, will solve the problem as to the cause and cure of pyorrhea, and most all morbid (unhealthy) conditions. There is no specific difference as to the bacteria that cause pyorrhea, carbuncle, appendicitis, headache, swollen glands, faces, etc., and most all ailments—for by using thorough and constant eliminative treatment with diet prevention, they all disappear—and healthy conditions are obtained. I can fully verify this from long service in clinical activities. Why we have different ailments and local morbid manifestations, as above enumerated, all from systemic origin, is simply nature trying to throw off the toxemias (poisons) at the point of least resistance. The poisons are taken up by the blood stream (circulation) from an unclean stomach—putrefactive changes of different kinds of waste products, that are not eliminated through the proper channels. The verdict of science is exactly opposite to the popular opinion, and bedside observations frequently controvert laboratory precepts.

Kircher, nearly two and a half centuries ago, expressed the opinion that there were definite micro-organisms to which diseases were attributable. The microscope has revealed that all decomposing substances swarm with countless millions of bacteria.

OPINIONS

BIOLOGICAL AND RESEARCH DEPT., PARKE DAVIS & CO.,
Detroit, Mich., March 25, 1914.

Dear Doctor Bliler: We have your communication of recent date on the subject of pyorrhea and have noted with very much interest the remarks you make on the subject. If we understand you correctly, the basis of your proposition is to combat local infections, such as pyorrhea alveolaris, auto-intoxication and various other conditions due to infection, by thorough eliminative treatment. In this opinion we believe you are entirely correct.

Very sincerely yours,
PARKE, DAVIS & COMPANY.

INQUIRIES

DR. H. E. BLILER, Chicago, Ill.

Dear Doctor: I have just read your paper on basic cause and cure of pyorrhea, in *Oral Hygiene*, and am greatly interested in it. I was wondering if you would give me further advice as to your treatment. I am getting some fine results with my local treatment alone, using improved instruments and methods, but I find I cannot stop the flow of pus. Thanking you in advance, and wishing you success, I am

Yours truly,
————————, D.D.S.,
May 12, 1914. Denver, Colo.

Practice limited to Pyorrhea Alveolaris and Oral Prophylaxis.

This clearly proves that pyorrhea is of systemic origin, for I stop the flow of pus in every case, and do not even clean the tartar off in many cases, leaving that work for the specialist. Much damage is done and inflammation created by too much instrumentation and grinding off of enamel, as endorsed by Carr.

THE DENTAL REVIEW, January, 1915

Doctor Valadier said that several weeks ago he had received a paper from Philadelphia giving him the results of Doctor Barrett's work, and he immediately called up his collaborators at the institute and started to make investigations on the same lines. Finding that emetin was a drug with which Doctor Barrett had been working, they immediately studied emetin to its full extent and found it was rather a dangerous drug. No instruction being given as to how it was to be used, it was tried on a monkey in which pyorrhea had been developed. The emetin was applied to the gums at 4:00 o'clock in the evening, and the monkey was dead at 9:00 o'clock next morning.

Doctor Kirk wished to emphasize his point of view that he did not regard it proven that emetin was a specific for pyorrhea alveolaris or a specific for the destruction of the entamœba buccalis. It has been shown very definitely by researches upon dysentery that emetin was not a specific there; that is was also destructive of bacterial forms as well. He was not sure that pyorrhea was due to a specific infection.

TESTIMONY OF A PATIENT

July 30, 1915.

HEALTH CULTURE CO.,
1133 Broadway, New York.

Editor Health Culture: I appreciate the value of your magazine. I consider it beneficial to your readers, and will let you know of my experience with Dr. H. E. Bliler's prescription. I am past 72 years of age. I was taken very sick last March and laid up for nine weeks. My family physician called in a specialist for consultation. I had to have a trained nurse to care for me. I was given no nutrition (food) for two weeks; strychnia was injected into my arm, for heart affection, for fifteen days. I was taken to the hospital and was given milk, eggs and soups for nourishment. It cost me $200.

One day I got a severe toothache and neuralgia in my head. My nurse called up the doctor, and he advised her to take me to a dentist. She did so. When I got to Doctor Bliler's office, he looked at me and said, "Your tri-facial neuralgia is due to intestinal stasis, constipation." He examined my heart and said there was no abnormal (unhealthy) condition, and told me there was no need for dental work.

But he examined my teeth, and some of them were loose. He treated my gums locally with iodin and gave me a prescription, and told me to take it every day at least for a month. I did it. After five days my teeth got solid in the mouth and I was able to eat, which I could not do before. To make it short, I took it for five weeks, every day, and am taking it ever since every other day, on the advice of Doctor Bliler. I have never weighed as much as I do now. My weight is six and a half pounds more than ever before. In fact, it did wonders for me.

Hoping you will publish this invaluable prescription of merit, and that I am not intruding on your invaluable time.

Yours respectfully,

5168 Indiana, Ave., Chicago, Ill. LEWIS LEWINSOHM.

THE PRESCRIPTION

Castor Oil is a soothing, healing, painless sedative; prophylactic (prevents disease), refrigerant (lessens body temperature), is unirritating to the stomach. If it is nauseating to you, it is due largely to your physical (bilious) condition.

Cures Colds, Rheumatism, Etc. Bad cases should take it daily at first. It will not weaken you; if griping pains occur, massage the stomach, drink hot water (not tepid); no bad effects after a few doses. Eat soups the corn products, malted milk and vegetables, avoiding meats. By using Oleum Ricini nightly, and malted milk with raw eggs only, for nutrition, the most acute stomach ailments are cured.

How it is Made. Go to the soda fountain at the drug store and ask for a glass of root beer, *foamed;* tell the druggist to pour in one ounce of Oleum Ricini and drink it quickly, without stirring, and you thus avoid the unpleasant taste. Drink digestible cocoa also for nutrition.

What Oleum Ricini Will Do. By taking once or twice weekly, it will produce healthy conditions, and will cure or materially assist in the cure of most diseases. The putrefactive changes of different kinds of foods create different kinds of bacteria, which are thrown off by the circulation, and attacks the weakest point of resistance, causing such ailments as carbuncle, pyorrhea alveolaris (pus exuding from the gums), tri-facial neuralgia, head and stomach ache, and many others. By its use I cured myself of ptomaine poisoning in New York City, in October, 1913. Gastritis and typhoid are all the same specie of disease. The slogan of science is prevention, and life is based on nutrition and elimination. By its use you save diseased teeth, and reduce inflammation and swelling in half the time required otherwise. Use iodin locally.

The use of Oleum Ricini in infantile ailments is traditionally old. The scientific administration and constant use, as a purifier and cleanser, is new, and the point that is important.

Many people are under the erroneous impression that by using eliminatives, and giving constant attention, one contracts the habit. Systemic cleanliness is as important as oral (mouth) hygiene, and is a good habit to acquire, Oleum Ricini being the most efficient cleanser of the system extant.

Peristaltic action is not sufficient where any morbid manifestations appear; what the specific germ or bacteria that create disease is of no importance. To clear the system and stop their formation is paramount, which this cleanser does.

Contributing causes of suicide are melancholia and pessimism, and is prevented in a measure by the use of Oleum Ricini, thus relieving systemic stagnation, and producing true vigor with the pink of youth on the cheeks and thus clarifying the skin. What we most need is immunity from erroneous impressions and predatory commercialism.

Try the above remedy if your minds are not biased. By application of basic principles we glean information which the imagination could not anticipate. Some time ago I read in Chicago papers of a young lady who attempted suicide, but instead of getting hold of a poison lotion, she took a powerful purgative. When she left the hospital she had changed her mental attitude toward suicide, and was glad she was alive. If prisoners weaken by a thorough course of elimination, give more nourishment, such as malted milk, raw eggs and a soup and vegetable diet.

It is the simple things in life that impart enduring nourishment. In nature there is a definite reason for everything. If you keep your stomach distended by eating too much, you create a false appetite. Eat less and you will require less to satisfy you. Disaster in the form of many diseases may be averted by adherence to the simple rules that underlie health—eliminative treatment and diet prevention.

4703 Indiana Ave.

THE PATHOLOGICAL AND PHYSIOLOGICAL IN ROOT CANAL FILLING

BY DR. P. A. GOULD, GIBSONBURG, OHIO

I HAVE HERE A PHYSIOLOGICAL SPECIMEN of a tooth, a superior right first bicuspid. The cuspid tooth in this case had been extracted before the patient reached maturity. The bicuspid shown moved into the space caused by the extraction and, rotating in the alveolus, it presented a space between the two approximate teeth, the superior right lateral and second bicuspid.

Twelve years before this tooth was extracted it was devitalized, the root filled and crowned with two porcelain facings adjusted to fill the space. No trouble was experienced from a small blind abscess to be noticed at apex of the root, and only the diagnosis of the dentist located the trouble; a slight pressure or fullness being experienced at times by the patient about the apex of the root of the tooth; no other symptom. So far as the use of the denture was concerned, the patient experienced no trouble whatever. At the time of extracting the tooth the patient was suffering from rheumatic arthritis.

Family history showed that near relations had died from pulmonary consumption. The case has not been benefited by the extraction of the tooth. Question: Was the constitutional trouble caused by the abscess on the tooth, or was the abscessed tooth a symptom of the pathogenic condition? (A very old and much disputed question).

To enter into the physiological study of the teeth that may be necessary to explain the pathogenic condition associated with the filling of root canals, will necessarily take in a greater field than that immediately connected with the structure of the tooth itself; and as this will be considered and explained in the operation of filling, we will leave the consideration of this part of the subject to be treated in its proper place.

In referring to my appointment book in which record is kept of operations from day to day, notice was made of abscessed teeth that were treated and refilled; no account was given of those that it was necessary to extract. It is to be explained that the teeth this record includes are only those that are abscessed, and were refilled, having previously been improperly filled; either the root canals not properly filled, or not filled when they ought to have been. I wish to call your attention to one thing in particular in this chart of work covering a period of one year. The time of the year when the most cases reported for treatment was when the sun is farthest south and we have the least sunlight. You all know these cases will report when they need treatment the worst, and not at some convenient time, which for some operations might be the case.

We wish to emphasize the possibility of the influence of pituitary disorders, which are always more or less present, indicated by this chart by the greatest number of teeth reporting for treatment. These disorders result in mouth breathing; we have ozæna, adenoids, tonsilitis, sore throat, laryngitis, bronchitis, pneumonia, pulmonary consumption, etc.; the first of these disorders causing nasal obstruction leads to one or more of the disorders following, supposing that no attention has been paid to resist the disease and nurse the affected parts, that the organs may perform their functions in a natural way. Obstruction to the nasal passage weakens immunity, a constricted arch of the palate associated with irregular upper dental arches constricts the nasal passages, and with the same consequential effects, causing mouth breathing, and an endless chain of effects following in their order which will in different individuals vary according to the resistance and habits that influence the environments of the bacteria that are subsequently developed.

	Teeth roots filled	Abscessed teeth treated, then filled
January	32	10
February	21	8
March	23	7
April	21	3
May	25	7
June	7	0
July	24	2
August	7	7
September	23	4
October	27	7
November	18	5
December	9	5
Total	237	65

Bacteria are divided into many groups and to enter into a study and classification of them would require one who is better informed on the subject than the writer, and an endless paper and discussion. It is enough for us to know, or at least to assume, that constitutional diseases are complementary to local infection, and immunity is greatly influenced by the nervous system and the mind by the stimulus given to phagocytes. Without entering into the ever-increasing perplexities of complicated varying constitutional diseases any further than to show the correlation of a few symptoms and disorders that are in direct relation and affected either directly or indirectly by the subject under discussion at this time, we will consider the filling of root canals.

The work of Dr. Thomas B. Hartzell of the University of Minnesota, in his observations of the correlation of abscessed teeth and cases of rheumatic arthritis, does not prove that the abscesses on the teeth are responsible for the disease, or does he so state they are, but that the disease is *influenced* by the oral infection.

Dr. H. H. Schuman, in a paper read before the Odontological Society in Chicago, January 6, 1914, said: "While the results obtained from the use of autogenous vaccines have in a manner proven the correlationship of various systemic disorders with alveolar osteomyelitis, or with other oral infectious troubles (by the manner in which the two are cleaned up simultaneously through the use of one vaccine), still at this time we would not be justified in accepting 'prima facie' the positive statement, as it is made by various observers, that such correlationship of the system's disorder had been conclusively proven by the action of the vaccines, and still less so, that oral sepsis was the primary cause. While definite proof for the etiology of such systemic disease may be lacking, or at least not be conclusive, it does not seem rational for us to accept these theories of the cause being oral infections as practically correct."

Doctor Schuman further noted in a paper before the same society in April, 1914: "There is a vast difference of opinion among men who have written on the subject of immunity created by vaccines, and it is not at all surprising as some of the fundamental ideas involved are in such a chaotic state, that men of great repute in this scientific research still have such diametrically opposite views on so many of the activities and theories which have to be taken into consideration in pursuing the study of this subject."

Traumatism, or surgical operations that heal, so that the physical faculties will in many cases resume an apparent normal state of functional activity, will be subject to and affected by other constitutional disorders; oftentimes developing a return of irritation to the parts, renew and increase the complication in the injured and affected parts; or it may produce toxemia, which carries with it a terrible influence in the constitutional disorder, and still shows no local irritation whatever.

With a knowledge of these facts it is necessary for closer relationship between the medical and dental professions, in the consideration and diagnosing of constitutional disorders, and the necessary consideration of the conditions that may be found in the oral cavity. This is becoming more apparent with every new discovery in scientific research which is so much interesting the two professions at the present day. In scientific research the pathogenesis which is so deeply associated with the practice of dentistry must always include a study of the physiological laws governing it, such as the destroying agents which are associated with oral infection, the pneumococci which occur in chain form, the staphylococci which are always present, and very frequently the micrococcus catarrhalis, and various forms of streptococci in sundry and uncertain quantities that are produced by abnormal conditions of the physiological, and are stimulated and nourished largely by conditions that may be controlled, and oftentimes avoided.

To turn to the physiological phase, we will omit the development as root filling during this period is not to be considered at any time prior to osteogenosis. The filling of root canals is justified only for the conservation of the tooth where we have abnormal physiological conditions and it is necessary to destroy the pulp of the tooth to accomplish it. It is much better to do this with as little local infection as possible. All the discipline and care taken in a thoroughly antiseptic operation will many times be of little avail if the root canal has been allowed to become infected before the operation.

Nature seems to have provided a resistance to the toxic infections of putrescent pulps of teeth in the decay and consequent drainage. These affected teeth may be entirely absorbed by decay and in many cases have caused little annoyance to the patient, so far as abscesses or pain are concerned. After death the decay ceases, and the teeth remain the last to be destroyed. Many of the early practitioners resorted to this law of nature for prolonging the use of teeth, by making artificial crowns that provided this drainage, but as no provision was made to check the decay associated with the open root canal, the ultimate results were not quite satisfactory. Only one law of nature was observed and not others that are established by abnormal conditions, and I fear we are doing this every day.

The greatest problem of today is the care that should be exercised to make sure that there are no pyogenic micro-organisms in the root canal beyond the filling at the apex or foramen. In the case of an already infected root this is *sometimes* overcome by treatments necessary to accomplish this end before filling; but we find instances and circumstances where pyogenic conditions are produced; where from all indications there was no reason to believe that these conditions existed at the time of the operation with the care taken in inserting the filling.

Such teeth as are treated with pressure anesthesia, when nothing has been used to arrest hemorrhage, which may be quite severe before filling, we will have an inflammatory condition at the foramen of the root which produces a serum filled with a ferment that will germinate pyogenic micro-organisms in the root canal at this point just as soon as systemic conditions provide the medium for them to develop. A tooth in this condition will have to be treated and given the care and attention that should be used to accomplish an antiseptic filling in a root where sepsis existed previous to removing the pulp, to attain best results.

When we see evil consequences that are apt to follow some form of procedure, or make it difficult, it is always best to take the physiological laws into consideration first, and make use of all that experience and study have taught. Nature can do more for herself if we yield to her laws and not try to force upon her some scientific theory when the conditions for its use are not present.

When you have healthy conditions present always complete an operation while these conditions exist rather than establish pyogenic conditions and try to overcome them afterwards.* Pure healthy blood may be forced back through the foramen of the root with a styptic that may answer for a filling material, the desiccative properties of which are sufficient to prevent forcing through the foramen what blood comes in contact with the filling, and its antiseptic properties prevent germinating any form of bacteria. A condition of this kind will be found more successful with the end of a root filled with mummified blood before any inflammatory condition presents itself.

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*See Dr. M. H. Fletcher's discussion, page 517, THE DENTAL SUMMARY, July, 1914.

What reason is there for extracting nerves from other than diseased teeth?

There is nothing that should attract the study and close attention of the practicing dentist more than the ever-varying physiological conditions that are presenting themselves to us every day in mouths that have been wrecked by the extraction of teeth. Normal conditions as nearly as possible should be the goal to be attained in every case, not only in relation to the tooth itself but also the relation the function of the teeth has to the whole mouth in the case at hand; the manner in which that function of digestion is performed, the mastication of the food. (See Dr. Henry W. Gillett's paper in THE DENTAL SUMMARY, January, 1914.)

The occlusion of the teeth form a very important factor in the efficiency with which this is accomplished; it also has a great deal to do in correcting as well as in establishing pathological conditions. These may be extensive owing to the effect of auto-toxemia from a pyorrhea pocket or blind abscess, and may greatly affect the pathogenesis of vital constitutional disorders. This may be influenced by the extracting of teeth, thereby wrecking the occlusion by traumatism, or actually destroying the use of some of the remaining teeth. How important it is in the filling of root canals; where the operation has been perfect in itself. When no consideration is given to the important anatomical features that happen to be present, pericementitis and pyorrhea will develop. We should see that the occlusion is so adjusted as to hold the tooth in its normal position in the alveolus, without rotating, rocking or tipping, and giving only the pressure when in use, that is proper to associate with it upon the peridental membrane, a thing impossible to accomplish in substituting any stationary bridge work when occluding with the natural teeth.

For diseased teeth affected with pyorrhea alveolaris it has been recommended to extract the pulps of the teeth and fill the root canals, as it assists the teeth to tighten in their sockets by the stimulus given to the only source of nourishment of the tooth that is left, the peridental membrane.

This operation is to be aided by dental splints or removable dentures as the case may require, that will hold the teeth in their proper position, and be so constructed as not to cause any of the before-mentioned irritations. Each tooth was created to fill only a certain position in the mouth. The necessity of supplying lost teeth in every way possible in a wrecked denture is very important; there are always a few teeth that may be kept as long as life lasts, and this statement has but few if any exceptions, should the laws governing hygiene and physiology be strictly adhered to

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See paper by Dr. Geo. B. Smith on "Mummifying Pastes" *Ohio Dental Journal*, Sept., 1901 by the physician and dentist, with the confidence and co-operation of the patient. Every piece of prosthesis will have new problems to work out which are in a sense different in particulars but all are governed by the physiological conditions that present themselves.

We will now enter into the consideration of physiological functions that hold a correlationship to the teeth, viz.: those that are associated and joined together, so to speak, by the fifth pair of nerves which arises from the cerebrum.

This nerve constructs the papillæ filliforma and sensoria of the tongue, rouses and fashions them to action and passion, and causes in them states corresponding to the forms of objects, to the modes of tangible substances, to the appetency of the blood and spirits, or the natural longings and affections, for the cerebrum has the office of feeling or perceiving what is about to be willed and of willing what it feels. Nothing better will show the causes and nature of the effects in the organic body, through an analysis of the nerves, than rational neurology, for all things are determined by the brain through the nerves. As the fifth nerve comes chiefly from the cerebrum, and is distributed to the sensoria of the body, it brings an intimate corelationship to states and conditions of all the senses.

The mind has its seat in the cerebrum, and it is apparent whatever will influence it will greatly affect the senses that are most intimately associated with it by the cranial nerves. Hence it is evident why so many things that are responsible for irregularities are greatly influenced by the correcting of the disorder in the mind first; the general appearance and conditions of the whole physical being may be changed, and vice versa, the failure of any organ to perform its function will have its effect upon the nerves associated with the affected parts, and thereby affect the brain, or mind. An injury that is slight may cause only a slight depression, but this may be serious if the injury affects some of the vital functions. The same with pathogenic conditions where the etiology is uncertain. Autotoxemia may apparently have no effect upon the growth and development of the body except in its effect upon the blood and nervous system and thence the development of the brain, and subsequently through the influence of the habits affected thereby. The development of a healthy brain bears a great part in the orderly discharge of the functions of the various organs. From this comes the great importance of the care of children's teeth, and the preservation of them involves the filling of the roots in many temporary teeth, which must be done for the twofold purpose of removing the focus of infection and re-establishing the function of oral digestion or mastication and a healthy assimilation.

To enter further into the correlation of organs associated with the fifth pair of nerves we have the papillæ of the tongue and the oral assimilation which has a great influence upon the circulation of the blood; this subject has been already treated by the writer in two different papers and read to society meetings, and we will not take it up here as it is enough to consider by itself. Effects that drugs and medicaments have through this assimilation will often cause, for one who uses them, very perplexing symptoms to manifest themselves, unless the operator is familiar with them, and will at times result in serious condition of the patient if the proper restoratives are not used at the time when control of the drug effects are the easiest to secure.

The quick action of the effect that drugs may have through the circulation of the blood is only a parallel of toxemia from foci of infection found in the mouth, mixed with nourishment in the food, and at times carried directly to the heart by the blood through the veins associated with the teeth, and mucous membrane.

The blood subsists upon many substances which are assimilated from the fluids and food taken into the mouth; also from the air and gases which are drawn into the lungs through the nasal fossæ; both of these sources of nourishment have direct influence upon normal conditions and constitutional disorders, which are classified with the study of therapeutics and pathology of constitutional disorders, disease germs, and the control of them. Classifying the germs produced by diseased conditions, and the development of new complications when these germs come under the influence of other environment to be found in different locations of the body when carried thence by the blood, will be one which will ever be discovering new germs and orders of bacteria, which will vary according to the change of the minds of men and their consequent environments. It is what is fed and assimilated into the blood and developed in the mind that governs what emanates, and the atmosphere he breathes, whether he allows it to be contaminated and foul before he partakes of it or not; also how he partakes of it; not only should he place a value upon the care of the physical and the necessary nourishment and atmosphere to keep the body in a normal condition, but, as is realized more and more, the necessity of the development of the mind in the knowledge of what is necessary to good health, and also what is necessary to the development of a healthy mind.

Many would be surprised to know how great an influence has the condition of the intelligence in the mind associated with the will, and the quality of the will, both of which reside in the cerebrum, in the development not only of normal but also of diseased conditions. And in considering this theory we must not separate the intelligence and understanding from the will and the affection, as in the brain and all parts of the body we have two of everything that works in harmony to perform a use that is one in its relation to the whole, and it does not profit anything to develop and improve the quality of one and neglect the other. Or, in other words, can we develop the intelligence to be of any benefit to the individual except there be developed an affection for the use of the knowledge gained? The savage and our native Indians develop physical forms and their associate diseases, which are a type of the food they eat and the atmosphere they live in, governed by their mental development.

The blood receives nourishment not only from the food and liquids, but also from the atmosphere; influences the development of the mind as well as the body, and if the condition of the blood suffers from any reason, the mind is affected, and vice versa, if the mind is affected the blood suffers as we find in mania, melancholy, states of anger, hatred, envy, sorrow, joy, cupidities of various kinds in the different temperaments.

All these things show how great a corelationship the mind has upon constitutional disorders and this must be taken into consideration when operations are associated directly with the fifth pair, the most important cranial nerves communicated with the sensoria, and the cerebrum or the seat of the mind.

Every dentist has had patients whose troubles their attending physician has been treating for some time; diagnosis is difficult and the etiology is very uncertain. They have an aching molar or maybe some other tooth in an abscessed condition. Examination of the gums shows the presence of pyorrhea pockets; treatment by the dentist results in relief and convalescence.

The relief of the constitutional disorder from the local foci of infection is not all that is to take credit for the cause of the systemic disorder, or is the removal of it alone all that effects the subsequent recovery.

In states of anger or fright caused by the fear of anything that will suggest physical pain or injury, a fluid will be poured into the circulation of the blood by the adrenals or the supra-renal capsules; this fluid contains a substance well known to the profession today as adrenalin; its presence in the blood is a protection against hemorrhage should the subject be injured; but causes a derangement of the stomach. This is very often the reason a patient will vomit a few minutes after being in the dentist's chair.

A patient who has fear of the dentist and is conscious of the fact of the necessity of going to the dentist, has a continued state or condition that causes an unnatural amount of this fluid to be poured continually into the circulation and the physical condition is continually affected by it.

Another important fluid which is continually being poured into the circulation of the blood is spoken of by some very early writers of anatomy. I will quote the following from Malpighi: "There is reason to believe that nature, in her solicitude to maintain the fluidity of the blood, is constantly pouring on it and mingling with it a certain fine active principle, by the motion and figure of which the mixture of the parts of the blood is facilitated, as well as their disposition to resolve and circulate." (*Dissertatia Dis Polypo Cordis.*)

There is a certain fluid of the highest degree of purity, called by some the animal spirit, which enters into the red blood as its principal substance, and constitutes its vital essence. There likewise appertain to the red blood in different proportion numerous salts, which enter into the composition of its parts.

But although the spirituous substance of every animal enters into all the genuine blood of the animal as its principal and only vital substance; nevertheless in every species of animal this blood is different, and varies in individual subjects of every species, according to temperaments, states, and ages. Moreover, there is both legitimate and spurious blood according to the health of the body.

Such spirituous fluid is interiorly conceived in the cortical and cineritious substance of the brain, the medulla oblongata, and medulla spinalis, that it is next emitted into all the nerve centers and is thence ultimately derived into the blood; that it is poured for instance by the brain through the veins which belong to its laboratory, such as those of the ventricles, infundibulum of the brain, and other organs, into the sinuses, and through these into the jugular vein. Also note the influence of the pituitary body; how disorder of both the pituitary and the teeth can affect the mind and thereby the whole body, as the quality of this fluid which is developed in the brain and nervous system is tempered in its quality by the development state and condition of what is contained therein.

Hence we see such a marked change of condition in this kind of patients, after visiting the dentist, when they find how painlessly and easily operations can be performed by up-to-date practitioners.

We are also warned of the great evil done in frightening little children, in letting them hear their elders tell of terrible experiences in the dental office, instead of recommending the services of the dentist.

INDIRECT AND SEMI-INDIRECT METHOD OF INLAY IMPRESSION*

BY DR. N. W. HIATT, MARION, INDIANA

Take the impression with modeling compound. Build moldine around impression for inlay. Place ring on moldine and pour S.S.W. inlay metal into ring. This makes a hard, smooth model. Press inlay wax in impression and carve; remove and try in the tooth and complete carving in the mouth. This is the semi-indirect method.

Indirect method: Impression is taken as above, but model made of inlay investment material. Separate model and compound and melt inlay wax into impression for inlay. Carve and trim away surplus investment material, leaving only that part the wax is in. Invest the wax model and investing material without removing wax from impression.

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*Clinic Indiana State Dental Association, 1915.

SPECIALIZED TECHNIC AND ADVANCED SERVICE FOR MUNICIPAL DISPENSARIES*

BY P. B. MCCULLOUGH

CHIEF DENTAL SURGEON, BUREAU OF HEALTH, PHILADELPHIA

DENTISTRY IS NOT SO MUCH NOW SUFFERING for the want of adequate methods as from the failure of a more general application of procedures already known. One sage has said: "To select well among old things is almost equal to creating new ones." Our failure to apply the truth of this axiom accords with the proverbially snail-like pace of progress deplored in all pursuits.

Our profession is not behind in inventive resources, but woefully loose in system and mechanical execution. The judicious selection from that which is, the arrangement in the order of fitness, the skillful application of the appropriate remedy, are wanting.

In this state of scientific looseness we invite by our proposed public service, public scrutiny, unafraid and unprepared. Wherever public service for children is conferred by the college, the undergraduate performance is regarded sympathetically, but proposed service by paid staffs of graduates under municipal government must expect not indulgence but scrutiny.

Individuals as a body in a position to influence appropriations must be prepared to meet the requirements, the failure to be so equipped explains why at this early period in this country some have failed and some exist now indifferently and unpromising.

The dental dispensary service as a part of the school system is not pauperizing, neither is it when a part of the health board. When under a municipal health bureau proper deference for the prerogatives of school officials is presupposed and co-operation of the latter an essential feature to success. Undue restrictions on the time of pupils by school officials has so restricted the time of possible service as to cut it in half.

We feel our experience has amply demonstrated that where any number of operators are employed, a dentist in charge is necessary, and that his prerogatives as a dentist be not infringed by a medical man or other executive ranking officer. This is the happy and harmonious condition in Philadelphia where consultation is frequent, pleasant and effective.

In our profession's public work our greatest service is mechanical; if there is any one period in life when this service is of greatest value it is during childhood—the elementary school age. Service is of doubtful value where the operator's individual initiative governs without instruction in policy and technic.

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*Read before the Lake Erie Dental Society, 1915.

It is a common occurrence to hear school medical inspectors complain that children whose parents have been notified that their teeth need attention return with the statement that their dentist said their "first" teeth do not need to be filled, because they will soon be lost. Too frequently this has been the case when the first permanent molars were involved.

The problem of what to do with the temporary teeth, I find, is beginning to concern our fellows engaged in this work in other cities, wherever it is a problem the service will be inadequate.

Remedy for this condition was first applied in our public dispensary at its opening nearly five years ago, our literature has been published, reprints distributed, but I have yet to hear of a place where this remedy for pulpless teeth is practiced.

Temporary teeth are to serve until their permanent successors erupt; their presence aids development and their premature loss insures almost certain irregularity of the permanent set. Abscessed temporary teeth, it can be demonstrated, impair by toxæmia the general health. They cannot safely be retained in this condition and they cannot be treated and filled if anything else is to be done; to extract them prematurely as a general practice is indefensible.

The first permanent molars present no less a problem and where individual cases demand their preservation, when pulpless, no single operation in dentistry is a greater test of skill. If we propose public service for children unable to pay and essay to do all the inexpensive operations required, what recourse is the child to have for remedy for the more costly operations required to restore accidentally fractured front teeth, or front tooth crowns lost by caries or disfiguring irregularities? The baked porcelain inlay is of doubtful practicability, the bought crown a temporary makeshift, and the rival systems in orthodontia are impracticable for public service institutions.

Specialized technic for temporary teeth and first permanent molars; ground porcelain sections for fractures, another kind of crown and a new orthodontia for advanced scope of service, are elements on which the successful conduct of public dispensaries depend.

INSTRUCTIONS TO OPERATORS

Order of Procedure

Regular Patients:

Record, diagrammatic and written, showing the exact condition of the teeth and associated parts shall first be made as provided for by the examination chart.

When a patient presents with one or more of the permanent teeth decayed that one in which the pulp is nearest exposure and functioning shall be the first to be filled. When a first or second molar is pulpless or requires to be devitalized and vital pulps in other permanent teeth are not in immediate danger, then the first duty shall be the treatment and filling of such teeth in the briefest possible time that safety and expeditious operating will permit.

Temporary teeth with putrescent pulps shall be the next in importance to receive operative treatment, because of the influence of the toxins by way of the lymphatic circulation on the general health. Care must be observed to diagnose the condition of the pulps in these teeth that no case be discharged until the remedy here provided for has been applied.

Emergency Cases:

Cases presenting for the relief of pain may be received without certificate and treated as emergency cases. Charted examinations need not be made, but the name of the patient, the letter "E" indicating emergency, the remedy applied and the condition for which relief has been sought must be recorded on the weekly sheet as the form prescribes. Operators' responsibility does not end with giving temporary relief, but must be followed by recommendation to the nurse, parent or child of the subsequent service the case may require and the course to be followed to become a regular patient under our rules. If the child is ineligible as a patient, consultaion with a private dentist is to be urged.

THE TEMPORARY TEETH

Reason for Preserving:

The retention of the temporary teeth until the time for their physiological exfoliation is an essential element in the development of the maxillary bones. The premature loss of these teeth is the chief cause of malocclusion of the permanent set.

Cavities in Vital Teeth:

Decalcified dentin to be cleansed with alcohol, dried, anesthetized with phenol, dried and stained with silver nitrate.

Exposed Vital Pulps:

Exposure to be enlarged, pulp desensitized with phenol, digested with potassium hydrate, and extirpated painlessly in one, two or three sittings. If a second molar with a sound distal wall, then two-thirds of carious portion of crown is to be ground away with a wheel stone, leaving the distal sound wall forming a right angle with the ground gingival line base, pulp cavity walls paralleled, mouth napkined, canals dried with alcohol and stained with silver nitrate, maintaining contact for a few minutes. The sound distal wall in the case of the second molar is retained to support the first permanent molar; in all other cases the entire crown is to be ground away.

Putrescent Pulps:

Canals to be cleansed, followed by the same mechanical and chemical treatment as given following pulp extirpation.

Pericementitis:

Pericementitis or incipient abscess to be relieved by opening pulp cavity and the careful and partial removal of pulp debris from canals and to be left open for not more than three days. The bacteriological content is sooner disorganized, deodorized and the tooth decolorized by exposure to the fluids of the mouth than by any germicidal treatment. Sterilization is to precede broaching that instrumentation may not cause extra apical infection.

Abscesses with Fistulae:

Decalcified dentin and pulp debris to be removed, fistula cautiously irrigated with hydrogen dioxid through canal connecting with fistula; mechanical and chemical treatment as given, which includes all pulpless temporary teeth.

When to Extract:

When time for the permanent successor to erupt; when abscess and pericemental necrosis contra-indicates further retention.

THE PERMANENT TEETH

First Permanent Molars:

The preservation of the vitality of these teeth is the aim paramount to every other technical consideration. The policy of this division and the technical system formulated has been evolved and is directed to the reaching of the greatest possible number of patients at the earliest opportunity to the end that structural imperfections in development may be repaired before pulp function is impaired by caries.

Occlusal Surface Cavities—Gutta Percha:

Small cavities in the occlusal pits of the upper molars and the fissures of the lower molars are to be filled with pink gutta percha base plate, when the opening after preparation is small in proportion to the depth, because, first, when all decalcified dentin has been removed overhanging margins may be retained that, for amalgam, must be cut away to the extent of retentive form only; second, in cavities of depth its insulating virtue is a pulp protector; third, where proportionately small surface is exposed to attrition it is permanent; fourth, its use requires little time.

Occlusal Surface Cavities—Amalgam:

Where the conditions are such as to indicate extending the initial cavity to include the fissures, because of the extended surface exposed to attrition, the labor and time involved, amalgam is to be used. When the initial cavity is deeper than the extended part, the deeper part is to be filled with gutta percha as an intermediate pulp protector, but in no case to be a base for amalgam by covering the entire cavity floor. When the decay is such that gutta percha cannot be used alone without becoming a supporting base, then cement is to be placed over the gutta percha as a foundation for the amalgam.

Approximal Cavities:

In the molars and bicuspids these cavities are to be made approximo-occlusal, and filled with amalgam using a matrix. Gutta percha or cement or both are to be used if the depth is such as to require this intermediate pulp protection.

Cavities with Pulp Exposure:

Whether actual and favorable for capping or approaching exposure the pulp is to be protected with the capping material provided and filled with cement; when an approximo-occlusal cavity, then the gutta percha cervical seal.

Diseased Vital Pulps:

Arsenic may be used to devitalize pulps when the rules governing its application and removal, elsewhere noted, are observed. At the time of the removal of an arsenical application, excavation and extirpation must proceed at once to the extent permissible by the avoidance of pain. When pulp removal is not possible immediately following arsenic, then phenol is to be used at the time of operating or as a dressing between visits to complete desensitization. Pressure anesthesia is forbidden.

Putrescent Pulps:

Sterilization is the surgical toilet treatment applied to canals preliminary to filling. The time required to disinfect canals is in proportion to the age of and extent of penetration of the infection. Canals from which a surgically desensitized pulp has been extirpated need only to be made aseptic before filling. Infection of long standing requires the repeated application of a germicide to effect sterilization. Drugs are an aid to, not a substitute for, skill.

Root Canal Filling:

Zinc-oxy-chlorid properly prepared, as a canal filling, has no superior; its proper use requires a high degree of skill. With average skill better results are to be had by undivided attention, and for this reason in the upper molars, for example, it is well to plug the mouths of the buccal canals with cotton and concentrate attention on the palatal canal. With the mouth napkined the canals are finally flooded with alcohol, this is blown out with the chip syringe, the oxy-chlorid mixed to a creamy paste and carried to the canal and pumped in with a smooth broach; it is then carefully compressed with a cotton plugger made by twisting cotton tightly around a broken broach with the end previously flattened with pliers. The first compression is designed to fill the apical fifth, so that very little cotton is used on the broach; combined plugger and twist action favors compressing the filling. Small quantities of the filling are alternately and repeatedly carried and compressed, and cotton on the borach repeatedly renewed. Any quantity of this material forced through a root will produce irritation, much may require extracting the tooth to relieve pain. A little forced through will produce pain; it is usually bearable and relieved by a counter irritant. Because of the greater freedom of the circulation around the apical area of young teeth the pain from this irritation is easier born and the excess material sooner broken up and distributed. The skill that cannot fill the apical end of an incompletely formed root with gutta percha without passing the orifice and making of this a permanent irritant, can fill the same root with oxy-chlorid, making of the latter a possible temporary source of pain and a permanent blessing.

Treatment for Hopeless Cases:

It has been authoritatively stated that the development of the jaws is greatest between six and twelve years. For this reason first permanent molars, even where they must be prematurely lost, should be preserved to aid in this development to as near the twelfth year as may be practically possible. Such as are not to be permanently preserved, grind off the entire crown to the gum line, parallel pulp cavity walls, cleanse canals, dry with alcohol and stain with silver nitrate.

When to Treat and Fill:

When three are savable, vital and the fourth is pulpless, time and skill must not be spared to treat and fill this one.

When to Extract:

Within the limitations above given, extract the first permanent molars when pulpless, where conditions are as follows: When all four are pulpless, extract four; when the two lower are pulpless, extract two; when two upper are pulpless, extract two; when one upper and one lower are pulpless, extract two; better occlusion is undoubtedly obtained by extracting four, but conditions and circumstances may not justify this sacrifice.

Second Permanent Molars:

Are to be saved, except when after consultation extraction is authorized.

The Bicuspids:

Are to be treated according to the technic outlined under first permanent molars. The different degrees being represented as follows: Occlusal pit cavities with gutta percha or amalgam; approximo-occlusal, first with amalgam, second with gutta percha and cement intermediate, third, pulp cap and gutta percha cement combination; fourth, devitalization, oxychlorid, gutta percha cement combination, if enamel walls are frail; or, cement foundation and amalgam if walls are strong.

Simple Approximal Cavities in the Anterior Teeth:

White high-heat gutta percha is to be used rather than cement wherever possible, where the extent of decay is such that this material cannot be used then the cervical margin is to be protected with pink gutta percha base plate as by this combination the permanency of the cement is materially increased.

Anterior Teeth Pulpless:

All teeth anterior to the first permanent molars are to be treated and filled, roots that are savable for crowning are to be treated, filled, ground down and the exposed surface stained with silver nitrate to the end that they may be ultimately crowned.

Matrix to be Used:

On all approximo-occlusal cavities in molars and bicuspids whether the filling material be a gutta percha cement combination, or amalgam. In all anterior teeth when the gutta percha cement combination is used the cement is to be compressed until set, with the matrix strip held in the fingers.

Parents' Authorization:

When in accord with these instructions the extraction of permanent teeth is indicated, operators at the branches are to instruct patients to obtain parents' or guardians' signatures on certificates provided for the administration of gas and to report at City Hall. This not to apply where teeth may be extracted without gas.

REMEDIES AND REMEDIAL MEASURES

Phenol:

Anesthetic and germicide: neutralized with alcohol. All cavities in vital teeth to be desensitized with phenol and dried, but not desiccated, before filling. The coagulation of the tubuli contents by this drug alone prevents the discomfort and thermal shock following filling where the cavity is not deep enough to warrant an intermediate.

Pulp Cap:

Calcinic zinc oxid (Hubbuck's), 90 parts, iodoform 10 parts, made into a paste with phenol is a superior capping material, when precise diagnosis indicates this remedial measure. Use cement only in occlusal cavities for filling and gutta percha cement combination in approximo-occlusal cavities.

Canal Dressing:

Iodoform and precipitated chalk, equal parts, twenty per cent. formalin in equal parts of water and alcohol mixed in a fluid paste at the time of using, is a most effective combination for sterilizing putrescent canals. Use with ropes or pumped in with smooth broach.

Potassium Hydrate:

Caustic and hæmostatic: neutralized with vinegar. Used to aid in the penetration of canals with smooth broaches beyond the margin of safety for engine reamers, digestive for organic matter, to destroy fungus gum and to stop bleeding at cavity margins. To be used with caution.

Silver Nitrate:

Coagulant and germicide: neutralized with sodium chlorid. Used to stain cavities in vital temporary teeth, ground and otherwise prepared pulpless temporary teeth and less frequently pulpless permanent molars, to prevent rapid decalcification of and recurrence of abscesses on during the time of their temporary retention.

Zinc Chlorid:

Astringent and antiseptic. Used in solution of one ounce to six drachms of water (the liquid of oxy-chlorid of zinc) to swab a cavity, following the anesthetic use of phenol to prevent pain, leaving a zinc deposit preliminary to filling. The last application in root canals preliminary to filling with gutta percha.

Arsenious Acid:

For pulp devitalization. Used with phenol to prevent pain.

Pulp Extirpation with Phenol Anesthesia:

Exposure to be flooded with phenol followed with potassium hydrate to digest pulp at exposure and improve access, pulp cavity to be flooded with phenol and with a fine smooth broach the pulp is delicately drawn to one side, allowing the capillary penetration of the phenol, having care never to puncture the pulp. This technic skillfully applied, allowing time for the caustic and anesthetic action of the phenol, makes possible the painless extirpation without the risk of extra apical infection caused by pressure anesthesia.

Extracting with Phenol Anesthesia:

Phenol flooded around the neck of a tooth inside the gingivæ, followed with a fine sharp lance cutting gingerly as the response of the patient shows the anesthetic action of the phenol, until the dental ligaments are severed, which can be distinctly felt with the lance, after which more rapid progress is made until the lance can be jammed between process and roots without pain. Sensation is greatest at the point where the pericemental membrane joins the gingivæ, therefore time and delicacy are to be particularly observed at the beginning.

Stomatitis:

Hydrogen dioxid used freely, irrigating the gingivæ around each tooth with a syringe, followed with the copious rinsing at the chair with Senn's solution, iodin one part, potassium iodide one part, water one hundred parts, diluted four times and a zinc chlorid mouth wash to be used at home should cure the worst cases of stomatitis in three visits in the period of one week.

Zinc Chloride	Oz. 1
Saccharin	Gr., S.S.
Aq. Menth. Piperit	Oz., 6

M. Sig.—Teaspoonful in half tumbler of water four times a day.

Room 708A, City Hall.

INDIRECT METHOD OF GOLD INLAYS*

BY DR. J. S. MC CURDY, FORT WAYNE, INDIANA

After cavity is prepared, vaseline the tooth and take impression with Kerr's impression compound, using a band to hold impression material. Fill up impression with amalgam, and allow it to harden, when you will have an excellent metal model to work with.

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*Clinic at Indiana State Dental Society.

PRESIDENT'S ADDRESS*

BY J. K. DOUGLAS, D.D.S., SANDUSKY, OHIO

SINCE IT IS AN ESTABLISHED CUSTOM of most dental societies to listen to an address by the president, I will on this occasion touch briefly upon a few points, wishing to give as much as possible of our limited time to the program which is to follow.

I wish first of all to express my appreciation of the honor conferred upon me by the members in selecting me as your president, an honor of which I am very proud, the highest one the state society has to give.

This is the 49th annual meeting of this society and the first one to be held since the completion of the reorganization. The state is now completely organized, having 29 component societies and the membership has been increased to 1250 members. While this is a remarkable increase in membership and the organization may feel flattered with the success it has made, it still has a very important duty to perform, and that is to consider the welfare of the component societies.

It has been my pleasure during the past year to attend the meetings of quite a number of the component societies and it is very gratifying to see the interest that is shown by some of them. Some have an attendance of nearly their full membership, and a program composed of papers, clinics and discussions, which were interesting and instructive, but on the other hand we have a number of societies that are not flourishing as they should, some through lack of interest, others may have professional jealousies which do not allow harmony among its members, while in some cases the men in a certain county may have poor transportation facilities in the district they are in, but could get good transportation if transferred to some adjoining district.

With these societies that are not prospering, this society has some missionary work to do. I would suggest (now that the state organization has been completed and all new members must be admitted through the component societies) that the organization and membership committees be dispensed with and a committee be appointed whose duty it will be to formulate such plans as will be necessary to create enthusiasm and increase attendance. The future of the state society largely depends upon the component society, the more active the component society, the more progressive this society will be.

Early this year the committees thought it advisable to select a part of its program material from the component societies with the idea of developing some of the talent we have in this state. A number of the societies received communications from the committees asking them to submit papers from which the committee might make a selection for the program of the state society meeting, with the result that only two or three made any response.

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*Read before the Ohio State Dental Society, 1914.

I believe that if some plan could be developed whereby the component societies might become interested and enter into competition with the object of having a representative chosen from its society to take part in the state program, it would be the means not only of developing essay writing among members of the state society, but it would enable the program committee to secure better papers from those members who have ability, but who might never be solicited by the program committee for the reason that the committee knows nothing of them.

My experience in selecting material for a program has been that the committee meets and names of persons are suggested. These usually are those who have often taken part in society work. The committee immediately begins to correspond with those whom they feel reasonably sure will take interest enough to answer the correspondence, either accepting or declining the invitation. Thus we see the same men on the program year after year, for the reason they have something to give and are willing to give it; but the time is coming when these men from whom we have so often received the benefit of their experience will no longer be with us, and we must have younger men to fill their places, and the place for these men to develop is in the component society.

I would like to urge every member of the state society to make a special effort not only to attend, but to take part in his local society.

SURVEY OF CENTRAL OHIO DENTAL SOCIETY CENTER

The work which is being done by the Central Ohio Dental Society may be of interest to a great many of you.

This society has made a survey of its district, ascertaining the average expense of and prices received for various operations, and from this a schedule of minimum prices was made, and distributed to each member. These prices are not to be obligatory, but act as a stimulant to aid in obtaining a better compensation for the services rendered.

Several questions were asked in the list sent out for the survey which were very interesting, and somewhat appalling to me. I will mention a few of them to give you some idea of what was asked:

Is dentistry hard on your health? 21 yes, 7 no.

Do you consider that your skill and the value of your services have increased since you began to practice? 30 yes.

Do you charge the same fee you did at first? 3 yes; 27 no.

Do you think you receive the fee you should for your services? 2 yes; 22 no.

Would you like to have the state society make a survey similar to this one? 28 yes; 1 no.

Would you grasp the opportunity to get out of dentistry into some other business? 22 yes; 6 no.

The last question is the one that seems appalling. If the same percentage of dentists over the state of Ohio feel that they would like to give up their chosen profession for other opportunities, it seems as if they might not all be in love with their profession. It is my opinion that their society will derive a great amount of benefit from this survey, as it places its members in a closer and more friendly attitude toward one another, and will be the means of stimulating many to do a better grade of work for a better compensation.

PUBLIC HEALTH FEDERATION

Within the last few months this society has joined with the following associations for the purpose of establishing an organization known as the "Ohio Public Health Federation:"

Ohio State Medical Association; Ohio Society for the Prevention of Tuberculosis; Ohio State Pharmaceutical Society; Ohio Eclectic Medical Society; Ohio State Homeopathic Association; Ohio State Veterinary Association; Ohio Commission for the Blind; Ohio State Boards of the Various Organizations.

The object is to have a central committee, composed of one member from each organization, preferably located in Columbus, to have entire direction of all matters pertaining to legislation and co-operative education during the session of the General Assembly, and has authority to circularize members of the General Assembly on any occasion where it is voted on unanimously by members of the central committee to approve or disapprove certain legislation.

This society should be ever ready to co-operate with other organizations in matters of this nature, the results of which will be beneficial to both the profession and the public.

DENTAL EDUCATION

There are few people, and especially dentists, who are over-educated and there are few of us who have been in practice any length of time who do not comprehend what a valuable asset a better education would have been for us.

Our profession within recent years has risen in efficiency, and is now expected to co-operate with other professional, philanthropic and educational organizations, as well as the laity, in the general uplift of humanity. In order that we maintain this standard which our profession has attained, it is necessary that our educational requirements be increased.

To maintain the dignity of the profession, and in justice to the young man who takes up the study of dentistry as a life work, we should adopt higher educational standards, and there seems to be no better way to accomplish this than to pass state laws governing the same.

At the present time the legislative committee is preparing a bill to be introduced at the next General Assembly, regulating the requirements of applicants wishing to enter dental colleges.

BULLETIN

During the last year I have received bulletins from a number of the different state societies which I have found very interesting.

A bulletin published quarterly by our state society would have a very pleasing effect upon its members by keeping them in touch with what is going on throughout the state in the interval of the annual meetings, and making them feel that the state society is taking some interest in them individually by keeping them better informed of what their society is doing.

ORAL HYGIENE AND PUBLIC DENTAL EDUCATION COMMITTEES

At the Rochester meeting of the National Association this year, it was decided to combine the oral hygiene and public dental education committees, to be called "The Oral and Dental Hygiene and Public Health Committee," this committee to take up the question of preparing a school text book on dental hygiene.

As this society has these same committees I would recommend that they be combined and the same name be used as is used by the National Association.

PANAMA-PACIFIC DENTAL CONGRESS

The National Association has accepted an invitation to postpone its 1915 meeting and meet in connection with the Panama-Pacific Dental Congress, to be held in San Francisco, beginning August 30, 1915. I hope it will be the pleasure of a large delegation from Ohio to attend as we know the profession of the western states has arranged for an interesting and profitable congress.

1915 MEETING

The meeting of this society to be held one year from this month will be the 50th anniversary, also another feature of importance will be the unveiling of the Miller Memorial, in honor of the late Dr. W. D. Miller, one of the profession's most cherished members. Let us begin at this time to plan one of the largest gatherings of the dental profession ever held in Ohio in honor of Doctor Miller and as a celebration of the 50th anniversary of this society.

I desire to make the following recommendations: That in outlying or border societies the clinician or essayist furnished by the state society for a component may be furnished from the membership of an adjoining state society. That a supervising committee of component societies be created, consisting of three members, one of which shall be the secretary. The duty of this committee shall be to look after the interests of said societies and give such assistance in their programs for meetings as they may consider advisable for the welfare of the society. That the number of clinicians furnished by the state be not limited to one per annum, but left to the discretion of the supervising committee.

Insamuch as the 1915 meeting of this society will be the 50th anniversary, the occasion should be commemorated by the publication of a historical booklet of dentistry and societies in Ohio. Also the publication of a monthly, bi-monthly or quarterly bulletin should receive consideration.

I wish at this time to express my appreciation for the work and interest that has been taken by the various committees to make this meeting a success, and to those who have kindly consented to take part in the program.

SEAMLESS CROWN*

BY DR. ROY ARCHBOLD, DECATUR, INDIANA

In making a shell crown you must not only restore the broken-down tooth and stop decay, but you must restore the occlusal surface, and the point of proximate contact. This kind of a crown is both artistic and useful. The following steps are necessary to complete this operation:

Step One: Suppose we select an upper first bicuspid. Separate the teeth with separating file, use a copper disc with carbo powder to make further separation. You then grind off the buccal and lingual surfaces until both are parallel, being careful not to leave any angles. Do not grind off the occlusal surface. Take plaster impression and make model of this tooth. Trim down the gingival line beneath the gum surface, about one millimeter. From this make a Melotte's metal die. If the tooth is badly broken down, you should restore the occlusal surface with a sloppy mix of amalgam, which also makes a good solid abutment to work upon. In this case you will have to make a future appointment.

Step Two: Take a wire measurement of the tooth in the mouth, which will come off easily, and fit at the gingival on the metal die. Select a gold shell that will fit tightly on this die. Trim the shell around gingival to the exact length. After placing the shell on the die, hit with a rubber-tipped mallet, which marks on the shell the points of cusps; tap the shell with a small mallet until it fits the die fairly well. Be careful not to hurry this part of the operation; tap lightly, and work the shell slowly. You must be sure to have your shell cut the exact length and shape at the gingival line. If you do not, your shell will buckle and spoil the operation. Drive the die with the shell in place into a block of soft wood. This will form a perfect articulating cusp, and give you an exact reproduction of the tooth to be crowned, which you cannot possibly get in using stock dies. Use your contouring pliers to make point of contact; restore buccal and lingual surfaces and fit around the neck of the tooth. You must restore buccal and lingual surfaces to protect the tissues at gingival edge.

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*Clinic at Indiana Dental Society, 1915.

Step Three: Grind off as much of the occlusal surface as you deem necessary to make a heavy cusp. Place a little soft wax in the cusps of the crown, place this on the tooth, have the patient bite until the articulation is perfect. After removing the crown, trim off feather edge of wax which overflows around the abutment. Paint the inside of crown with wax in place, with Steele's anti-flux moistened with turpentine. Lift out the wax, then burn out turpentine which leaves a black rim inside of the crown with cusps showing bright. You are now ready to flow your solder into the cusps. The anti-flux will keep the solder from hopping up on the sides of the crown. This will make a cusp equal to the one you would cast, filling every part of space possible with solder, and in setting the crown will leave a very thin layer of cement between the abutment and cusp, which makes the crown set very firmly to the tooth.

EDUCATION AND ORAL HYGIENE REPORT*

BY E. W. REAM, CRAWFORDSVILLE, INDIANA

Section II under Article 3, duties of committees, under By-Laws of I.S.D.A. reads as follows:

"Education and Oral Hygiene Committee.

"It shall be the duty of this committee to devise and promote such methods as will serve to educate the general public throughout the state in oral hygiene, and a more intelligent care of the teeth. They shall select any assistants they may deem necessary to further their work, providing no unauthorized expense to the association is incurred."

Doctor Jessen, of Strassburg, Germany, the originator of this oral hygiene propaganda, little thought of what a masterful stroke he was executing for the good of humanity, and how the benefits of this propaganda would reach into the individual's life of all civilization. For the well being of the individual, community, state, nation and civilization, its employment is paramount.

Mouth sepsis, its prevention and removal, is the one thing above all others that is engaging the serious consideration of not only the dental profession but the best part of the medical profession as well. In fact, if you recall Dr. G. E. Hunt's paper, read before this body at its 1914 session, and which is reported in the April (1915) DENTAL SUMMARY, page 325, which this committee urgently recommends you to study, you will find that he gives the M.D. credit for recognizing the seriousness of mouth sepsis first. We quote from this paper: "The better physicians have learned this. They learned it before we did (just between ourselves) and it has been a good deal of trouble for them to hammer it into our heads."

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*Report of Committee on Education and Oral Hygiene, Indiana State Dental Ass'n.

Within a period of three years, Doctor Jessen, Strassburg, Doctor Osler, Oxford, and Doctor Hunter, London, began their clinical investigations of mouth sepsis more than 25 years ago, neither knowing at the time of the others' efforts. Scientifically their conclusions are the same, viz., that mouth sepsis, like foci of infection in any other part of the body, is contributary to systemic disorders; that the frequency of its occurrences, both from neglect on the part of the patient and from illy advised and illy performed dental operations, makes it a serious consideration to the well-being of the public health.

The incipiency of the oral hygiene movement has engaged the advanced minds in all localities where it has resulted in the good for which it was intended, and the dental as well as the best part of the medical profession feel that the same class of minds must be awakened on the merits of this move if equal results are to be gained. Community oral hygiene is not the burden of the dental profession. It is its duty to show what it can do for a nation and to help with all means possible in its establishment. It is a move that deals with the health and economics of a country and the returns it shall make; and therefore the state should bear the expense to make its people understand the benefits derived from the practice of its principles.

Inspection versus Instruction: This committee, after interviewing fifteen city school superintendents, eight educators, and a score of successful business men, feels that inspection before instruction is a plain case of "the cart before the horse." The numerous cases of school inspection made before instruction has been given and followed by a "nothing doing," attests the folly of school inspection first in an effort to permanently establish an oral hygiene propaganda. It is evident that a plan should be evolved that will be consistent with placing the principles of oral hygiene before the state that may lead to instruction on this subject in our public schools. Dr. W. G. Ebersole says: "The schools are the hub of the oral hygiene movement." The nations of the world sanctioned the wisdom and importance of oral hygiene by placing dentists in the armies and navies. Why not oral hygiene instruction in our public schools? The efficiency of the German soldier in the present gigantic struggle evidences the wisdom of its early employment.

Doctor Howard and Doctor Hunt presented a bill to our state legislature for a compulsory medical and dental inspection law, and its failure of passage is directly attributed to the lack of instruction. Indiana today has only a permissive medical school inspection law. The following is a paragraph from the Medical School Inspection Law:

"Medical Inspection defined—Sec. 2. The term, medical inspections, as used in this act, shall be held to mean the testing of the sight and hearing of school children and the inspection of said children by school physicians for disease, disabilities, decayed teeth or other defects, which may reduce efficiency or tend to prevent their receiving the full benefits of school work."

Section 3 of this same law reads: "Beginning with the school year, 1911, school trustees and township trustees may appoint at least one school physician for each school corporation," etc. This throws the whole load on instruction, and our state will never be lifted from this situation until there has been enough instruction infused into our people to lift the cargo, oral hygiene, valuable as it is, above all legislative obstructions.

This committee suggests the following, and hopes that some plan may be worked out of it and your suggestions that will permanently put our state on the oral hygiene map:

An act entitled, "An act to prevent disease, conserve the health and lives of the people of the state, with especial stress for the young, to develop and promote their efficiency by providing mouth hygiene instruction, inspection and care:

"Be it enacted by the general assembly of the state of Indiana that the state board of dental examiners with the approval of the governor of the state, shall appoint an officer to be known as State Mouth Hygiene Instructor, who must be a resident free holder, and be of good moral character and a graduate in dentistry from a dental college recognized by the National Association of Dental Faculties, and have practiced dentistry in the state not less than five years, or other dental work its equivalent.

"It shall be the duty of the State Mouth Hygiene Instructor to act in conjunction with the state board of dental examiners to devise and promote all means that will lead the people of the state in establishing and maintaining healthy mouth conditions.

"He shall visit the various counties of the state, and by means of lectures and such other means as the state board of dental examiners may indicate, proceed to instruct the general public by an open lecture in the principles of oral hygiene and its economic advantages. He shall, as defined in Section 2, Medical School Inspection Law, co-operate with school boards, city school superintendents, and township trustees, in giving instructions and lectures to the high schools, departmental and grades, in such way as shall inure to a better understanding of the importance of healthy mouth conditions as related to economics and general efficiency. In compliance with the Medical School Inspection Law, with the consent of the school trustees, or township trustee, hold a complete or partial inspection of the schools that will better enable him to place facts before the public as to existing conditions and requirements.

"Be it further enacted that all teachers, State Superintendent of Public Instruction, city school Superintendents, county school Superintendents, School Boards and Township Trustees are hereby made a party to the spread of the principles of mouth hygiene among the public schools, and that they accord and give all consistent help; and that the State Mouth Hygiene Instructor is given power to draft any dentist, or dentists, to carry his work forward in any locality where he may be working at the time, provided not more than a day is taken off each dentist so drafted.

"The State Mouth Hygiene Instructor shall encourage the organization of compenent societies in each of the counties of the state and act in every way to promote the same for the I.S.D.A. It shall be his duties to report all law violations to the State Board of Dental Examiners with all information obtainable.

"Be it further enacted that any one within the state of Indiana who shall advertise Painless Dentistry and fail to make such operation or operations painless, is hereby made amenable to the statutary law of the state for fraudulent representation. and such penalties as this law imposes.

"The State Mouth Hygiene Instructor shall be paid a salary of $3500 annually, and he shall be allowed his necessary expenses while engaged in the performance of his duties.

"An appropriation of an amount to pay the salary and expenses of the State Mouth Hygiene Instructor is hereby made out of the State Treasury from moneys not otherwise appropriated.

"This law is a contingency and goes into effect at once, and is a part of the law entitled, 'An Act to Regulate the Practice of Dentistry.' "

A law similar or like this enacted would not only be an "eye opener" to the people of the state, but to the nation as well. It would place the burden where it belongs, and elicit recognition and respect when ever the State Mouth Hygiene Instructor appeared on the scene.

A CAST POST MODIFIED RICHMOND CROWN AND A TEMPORARY ANTERIOR CROWN*

BY DR. E. H. EBERLE, CINCINNATI, OHIO

THE INTENTION OF THIS METHOD is to eliminate the weak features of the Logan and the full-banded Richmond. The labial border of the root is trimmed for a distance of about one thirty-second of an inch under the free margin of the gum. The palatal portion of the root is allowed to remain as long as possible, and not to interfere with articulation. The canal is prepared in the usual way, enlarging the entrance so that the cast post will have sufficienct strength at that point. A small portion of softened inlay wax is then forced into the canal and withdrawn again in the usual way with a sprue wire. After investing and casting with scrap gold, that would assay approximately 18-k., the post is notched lightly on two opposite sides, with a separating disk, so as to give firm attachment for the cement when completed. If impression was carefully taken, the post will be found to fit snugly and more accurately than any ready-made post. A piece of 34-gauge, 24-k. gold plate is now burnished and malleted with a foot plugger in the automatic mallet, over the face of root, and formed neatly into a collar to extend around palatal portion of root. An opening is made through the cap to admit the head of the post. The cap and post are held together with some sticky wax and carefully withdrawn and soldered. The cap and post are again placed in position and again malleted into firm contact with the root. A wax bite and impression is taken, after which a pin or interchangeable facing is ground in, in the usual manner. A temporary anterior crown, to be used while the Richmond is under construction, is quickly made and applied in the following manner: Select a shoemaker's iron nail that fits the canal, flatten the head a little so that it slips into the slot in a Steele facing that has been previously selected. Cement post and facing together, and attach to root with gutta percha.

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*Clinic Ohio State Dental Society.

ACETYLENE FLAME, THE LABORATORY HEAT PAR EXCELLENCE*

BY W. F. WILSON, D.D.S., CLEVELAND, OHIO

With the passing of artificial gas, we have been searching for a fuel which will give us equally as good or better results when used in soldering or casting.

In acetylene, which we can purchase in tanks designed for use in automobile lighting systems, we have a gas which will give us all the heat we require, while it is as safe and its flame is as easily controlled as that of any fuel in use, and which can be used at a cost of only a few cents per month.

For soldering crowns, bridge work, etc., the only equipment necessary is a tank of gas, rubber tubing and special dental blowpipe, all of which articles can be purchased from the Prest-O-Lite Company, either directly or through the dental supply houses.

For casting gold an intense heat can be secured by using an ordinary artificial gas blowpipe, combining compressed air and acetylene. For melting platinum a higher air pressure combined with acetylene or oxygen and acetylene in combination are used.

In combining compressed air or oxygen and acetylene, the air or oxygen should be turned on first, then the acetylene. If acetylene is allowed to ignite unmixed with air, as it comes from the artificial gas blowpipe, a heavy soot is formed as the result of incomplete combustion of the carbon content of the gas.

Where compressed air is not available it will be found that acetylene alone used in the Prest-O-Lite blowpipe will give all the heat required the combination of compressed air and acetylene merely giving a greater degree of heat, which lessens the time required for melting gold for casting purposes and secures a degree of heat in the molten gold which causes it to remain in a liquid state for a longer period of time.

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*Report of Clinic given at Ohio State Dental Society, December 4, 1914.

A comparison of the time required to flow a given quantity of 24-k. gold gave the following results:

Artificial gas .... 25 seconds
Gasoline .... 30 seconds

(Greater length of time required than that of artificial gas probably due to impurities in gasoline.)

Acetylene alone, using Prest-O-Lite blowpipe .... 25 seconds
Acetylene with compressed air, using artificial gas
blowpipe .... 6 to 15 seconds

(According to amount of air and gas pressures used.)

Acetylene combined with oxygen gives a heat of 6300 degrees and is the hottest flame known.

The cost of installing the equipment is practically the only cost, as the cost of operating is so small as to be negligible. In buying the large size automobile light tank (40 cubic feet), hose and blowpipe, initial cost is less than eighteen dollars and the cost of refilling tank one and one-half to two and a quarter dollars, depending upon where purchased. A tank of gas will last six to eight months, making the cost the small sum of twenty or twenty-five cents per month. This has been the cost in my own laboratory. This gas has given excellent results in my laboratory and while this may appear to be an advertisement of the Prest-O-Lite Company's manufactures, it is not written with that end in view, but to acquaint the members of the dental profession with a fuel which I believe will solve many of the difficulties experienced in the use of the inefficient, expensive or dangerous gases, which we have been forced to use in the past.

Used in the manner outlined, acetylene is the most efficient fuel that we have for use in soldering and casting, as it furnishes all the heat that could be desired, its use is safe, the appliance being portable and very easily operated, makes it most convenient, and its use is more economical than any other system that is being employed at the present time for this purpose.

COMBINATION FILLING OF CEMENT AND AMALGAM*

BY DR. GEORGE B. SMITH, FREMONT, OHIO

This is a mixture of amalgam and cement for retaining amalgam fillings and protecting frail walls. There is no retention made for filling at all. The amalgam is mixed as you would to make an amalgam filling. A small amount of amalgam is taken, and also a small amount of cement is mixed. The two are then mixed together, which makes a very sticky mix, also slightly retards setting. The cavity is then lined with this mixture, which is very adhesive. Then pure amalgam is burnished into this mixture. Slow-setting amalgam, also slow-setting cement is recommended for this operation. This is useful in sensitive cavities where they cannot be properly cut out, for protecting frail walls and building up teeth preparatory to crowning.

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*Clinic at Ohio State Dental Society, 1914.

HEALTH CONSERVATION

HIGHER QUALIFICATIONS FOR MEDICAL AND DENTAL GRADUATES*

BY DR. W. O. THOMPSON, COLUMBUS, OHIO
PRESIDENT OHIO STATE UNIVERSITY

I HEARD A STORY some time ago of one of our neighbors here in Columbus who unfortunately had lost the combination of the family safe, and he was distressed about it. It occurred to someone in a happy moment that there was a gentleman over in the Ohio penitentiary skilled in the matter of safes, and they sent for him, and after two or three days of impatient waiting he came, and within fifteen minutes the safe was open. For the first moment the family felt great relief. After they had thanked the gentleman for his services, and the family became quieted down, it occurred to them that they weren't quite as safe as they were before. When that gentleman becomes again a full citizen, instead of being an impaired social unit for the time being, all of our safes are at his mercy, and where shall we be? And the family agreed there was something needed more than skill as a guaranty of safety and efficiency in the community.

In regard to our educational standards there have been many opinions on what should be done, and great emphasis has been placed on skill. I don't say too much emphasis has been placed there, because I think any person who has had to undergo the expense of repairing anything, from his kitchen floor to his most precious body, will recognize that skill is really valuable, and that it has a very large place in human affairs. Some of our educators have thought that the development of skill was one of the chief aims of education. That has been particularly true of all our teachers of technical education; the engineering groups, the manual training groups have felt that skill was quite as necessary as the old-fashioned teacher of penmanship used to feel it. And so the public has sent its children to the school, believing a large amount of skill would be developed there, and that this skill was somehow a guaranty of strength and place and position in the world's work. Far be it from me to undervalue the importance of skill, but I think the experience in the little story with which I started out indicates that underneath this skill there needs to be another guaranty in the form of character to guard that skill. Whether education can produce character or not has been a debated question for all these centuries. Many people have gone out with the idea that the final aim of education is character. Some say morality, some say self control, some say this and some say that, but they feel that underlying all the skill and efficiency of a generation there must be some character that will bring about the proper use of this skill. I suppose none of us would underestimate its importance if we stopped to think of it in our professional lives, and of our patronage of professional people who come to our assistance now and again. And still I think in the student's mind when he is undertaking to prepare himself for professional service, the emphasis upon character is not as clear as it should be. And hence there is often developed in the underlying years of education on the part of the ambitious member of his class a little lack of ethical idealism that enables us to go on undiscovered, and we become the quacks and shysters in our profession, and society suffers by reason of that fact. One of the very encouraging factors in modern professional life, as I have seen it among the lawyers, physicians and dentists and other professional men, has been the feeling and consciousness that somehow this question of the character of the profession is vital and fundamental, and our men and women have come to see that there must be something back of this education and skill and efficiency that somehow guarantees society the best net result.

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*An address before the Ohio State Dental Society, 1914.

In our efforts to put up standards of education from the kindergartens on through to any phase or state of education, we have been troubled with this problem, the character of the people who are teaching, the character of the people who are pursuing education, and any method by which we can protect the professions into which men and women go by some test of character. It is very difficult to say to aspiring boys and girls that you cannot enter here because you haven't sufficient moral character, because there are no tests we can apply to boys and girls that would be a sufficient test of moral fiber to enable us to say yes or no to an applicant. So all our elementary schools are wedded to the theory that school is a place for improvement, and therefore the benefit of the doubt should always be given to the boy or girl who is willing to make some effort towards improvement, whether that effort be made toward general education or particular or special education; and so the tendency of society is to take the charitable view toward all boys and girls that approach us in the cause of education, and for that same reason we take the same charitable view of men and women who come before us from a professional point of view. After a person has a certificate saying he may practice dentistry, law or what not, the public mind seems charitably disposed toward the beginner, and they are apt to be welcomed cordially and accepted with more enthusiasm than knowledge. The result is into all our professions come year after year men and women who lack something vitally important, which lack cannot always be supplied by any machinery that the school may invent or any organization of society may develop or any means available to protect ourselves against these things. Nevertheless, the consciousness is increasing every year and the conviction is deepening every year that these important professions should not be so occupied by men or women whose standards of education and standards of life and service and efficiency are not such as to guarantee to us the best results, and to protect us from the evils that come with mere skill unassociated with character or proper professional idealism. Because that thing is becoming increasingly evident, all the schools of the country have felt the pressure of raising the standards; dental schools, medical, law, theological and engineering schools are all feeling it, and these people are supposing, when we have raised the standard of education for entry to any particular form of study, by that fact we have probably eliminated a certain portion of undesirable candidates—and I presume that is true; if it were not true, then it is a serious charge against any standard of education for entry into business.

One of our great universities for many years had no standard of entrance, but a standard of exit. They said: "You may come here and make a trial, but you cannot leave here until we know who you are and see what you can do." And there was some wisdom in that, based on Thomas Jefferson's idea of education. But the experience of the universities of the country has set that aside, and the experience has been such that the American people have come to believe that the only proper entrance into advanced education is by means of the ordinary school facilities provided at public expense. So not an educator in a thousand today would advocate a man's going to college unless he had graduated from high school. If we saw a boy in college of high school age, we would say his place is in the high school, and I think the time is coming when men will say that we do not want a man in law, dental or medical schools who is of high school age; that he doesn't belong there; put him in the high school where he belongs. We would let him come when he has proven himself, by proper probation in the elementary and underlying schools. How far you will push that in the future no one at present is able to prophesy—perhaps it is unnecessary to—but the common opinion of the American people is that the underlying education is at present the most efficient method we have of eliminating the people of unworthy ideals and purposes and of defective character.

It is not necessary at this point to say that the graduates of a high school sending out one hundred people a year give us a hundred people of equal standing as to scholarship, efficiency, skill, moral character or fitness for professional service for higher education. Not at all, because a certain portion of that hundred, if they go on, will drop out by reason of one cause or another; but the school up to date is the most efficient instrument society has yet discovered or developed for the elimination of those who are unfit and for the development of those who are fit, the development of those who have what we term capacity, and for the elimination of people who have not capacity. So that every school organization is a sort of probationary ground in which the boys and girls are trying themselves out, proving their skill and efficiency, and making some demonstration as to their fitness for larger service.

As the school is the best organization society has developed or known about, we are bound to depend upon it for nearly all our purposes. This is not to say that I couldn't stand here and find fault with the product of the schools. I could do it, and without serious thinking, and without a great amount of intelligence. I could find reason for saying that certain products of high school and college, and medical school and law school, and dental school were deficient. There isn't any school organization yet developed or that ever will be that will guarantee its product, that every one will be equal in his fitness or qualification; but we can reach a certain minimum of fitness or efficiency for service. That minimum being raised from year to year, we have a better average and standard in our professions than if the minimum were neglected. That is the logic, common sense and experience of the situation as well. There are certain reasons why I think the medical, dental—and I speak not of them alone in these matters, but of all professional schools—should have regard for their own quality and character. We find at most of those places two rather warring factions: those who believe that since entrance requirements cannot be the final test of all fitness, that they should be administered with looseness, forgetting that that kind of administration defeats itself. Then there are strict disciplinarians who believe in the formal side of education strongly, and insist on the administration that fulfills the letter of the law and sometimes kills its spirit. In other words, it is possible to have an equitable administration of those things such as to commend them to wise men everywhere and get the best results, and that is the problem with which the educators everywhere have to deal.

The question of standards, after all, is nothing external or objective; it is something subjective and personal all the while. To be sure, there are certain external and objective things we may insist upon. If you go just outside of this partition in the rear you can see certain sanitary measures there advocated, certain appliances that indicate to you at once a very careful attention to sanitary matters. You can see appliances used in dentists' offices that would indicate a good deal of care about those external and objective things; but, after all, the measure of this thing will be found in the efficiency and quality of the individual himself, and every one of us here tonight would count it a great privilege to stand in the presence of one of our own profession who had achieved some rare skill or excellence, and see a clinic demonstrating that fact. When we observe a thing of that sort, every man and woman feels a certain inspiration, an uplift, a certain superiority that he never could have until he has seen such a clinic or demonstration. In other words, the superiority of the most excellent among us sets the standards for our profession, and after we have gone through with all those standards of education in the dental colleges and the law schools, we must depend on the profession itself to maintain within itself such professional ideals as will make possible for a generation the protection against quackery and knavery, and dishonesty and incompetency.

For that reason I think it is encumbent upon the ordinary dental and medical college, as upon the ordinary educational organization, to follow the principles of the University of Virginia as to the exit. We put more emphasis in these days on the entrance than on the exit, but I think there is a great deal more danger nowadays in the exit than elsewhere, because it is, I think, not to reflect on these colleges, to say that any boy who cannot fool his professor has thereby proven his unfitness to go to school. If I felt there was a student in our university who couldn't fool a teacher, I would say he shouldn't be there; that he is incompetent. I have said that any boy who cannot earn his living has no business to be there. You don't go to college to learn to make a living; if you cannot make a living you shouldn't be there. This isn't an institution for incapables and incompetents. The boy then takes a different view of his whole course of instruction, and the question is whether we can follow him along and say to him, "We advise you to drop out of this business." We have said that in many instances; we have advised boys after one, two and three years: "You are in the wrong pew; this isn't the place for you. You have gone wrong in your judgment; we don't condemn you individually or discount your talent or efficiency, but you are not where you will make the most of yourself."

You know they say that a great many people have spoiled first-class farmers to make second-class preachers. Why shouldn't we say, "Don't spoil a first-class blacksmith to make a second-class doctor;" why shouldn't the school say so, and why shouldn't we make the exit from the university more difficult than the entrance, however difficult the entrance may be? In other words, the eagerness to produce the product, to graduate men and women and make a show to the world has tempted our colleges to graduate men and women who should not have been graduated, and the sympathies of the multitude in this matter are so strongly developed that they say, "Give them a chance." That is where I raise the objection. I don't want anybody to say to me, "Give this fellow a chance—at your mouth; and this fellow a chance—at your heart and your stomach," unless I know he not only has the skill but the character back of the skill that will warrant my putting my life and my interests in his hands. It is a serious question as to what our attitude shall be towards a man in progress of education. It takes moral courage to sustain your standards all along the line, but it should be done.

Many people assume that because a person has graduated from college that is the end of all things. I remember when I went to Central Illinois, a young chap, that community assumed because I had graduated from college that I was able to teach anything, and I wasn't smart enough to disabuse them of that impression. The assumption is wrong. But men will come to Columbus and put up a sign as a physician or a dentist that leads us to assume they are equal to any problem that might be presented to them, and that is hardly fair treatment to the public. Who is responsible for that thing? It may be difficult to find out, but the standards of education as applied to our professions should be a closer test. I suggest that you cannot make them a final test; I suggest that in the final analysis those tests cannot be so closely applied as to eliminate in every instance the unfit. Nevertheless, the fact remains that a closer administration of those standards of education would eliminate some of the unfit not now eliminated and would give greater spirit to those retained. We ask that the professional men and women of the country shall stand, not in an exclusive and Pharisaical sense, but in real devotion to the cause of service and truth; that the entrance into the profession and maintenance of standing in the profession shall be such that the public shall be protected, and that the public may have a new confidence in the character and fitness of professionally educated men and women.

We are passing from a private to a public conception of education. There was a time when the dental college was a private affair, and the same with the medical college—a proprietary school, it was called in the beginning. I do not want to cast reflections upon those schools, because they started a good work, but as the years went on and the science of medicine and dentistry and other subjects was developed, it became evident that the expense of keeping up an establishment that should be strictly up to date in its methods of instruction was too great to make it a matter of profit, and besides that, it was soon developed that there was in the proprietary school the tendency that comes out of the greed for money, that hindered these people from presenting the best results to the public, and there were selfish interests that could not be well controlled, and as a result of that most of those institutions have been speedily developing a liking for publicity and public relations. The consequence is that in most places the private schools have become identified with public organizations. It did not at once help things, or reform men, or improve the methods of teaching, or re-equip those schools in the best way, but it was a move in the direction that education was for the public service, and public service was for the public welfare, and that professional men and women were to present themselves as public servants, in whose minds and hearts the public welfare should always be the supreme motive in determining their professional conduct. There is no better illustration of that thing than the matter of physical inspection in our public schools. We haven't yet come to the dental inspection as much as we wish, but we are coming to it steadily. Why? Not only because health is an asset to the community, but we have come to see that the condition of one's mouth is not a moral issue alone, as it was in my day, when the only thing about a boy's mouth was the danger of swearing, but that there are other dangers quite as real as profanity; that the physical uncleanliness of one's mouth may be a serious menace to his spiritual welfare as well.

Our profession has said to the public that the efficiency of this uprising generation is tied up with this and that man's standard of health, of service, of ideals in the profession, has been developed until men and women are coming to see that the profession of dentistry and medicine and law is made up of a group of men and women in whose lives and hearts the appeal to public service may be made upon the highest ground, and to that appeal the best men and women heartily respond.

The dental, law and medical colleges in developing men and women are coming to see that it is their duty and privilege not only to enforce the entrance requirements and exit standards, but to put in those men and women the right ideals as to public life and service, and professional honor and ethics and those matters are by no means to be forgotten or overlooked in the development of our institutions. We are passing toward the stage of public education in which the public shall control, and professional education is the next step toward what will be the public control of all education. I shall not live to see it, but men and women here will, when public control over every private school in the country will become efficient. We are going to see that no agency that has to do with the training of citizens, the development of men and women, the education of professional men and women may escape its responsibility to the public for the character of the service; and as the years go on the public will recognize and undertake its duty to supervise these educational processes, and so far as the school may, which, as I say, is the best organization yet developed for the determination of standards and character, we shall see to it that the standards of those who would serve the public shall be such standards as the public will approve, and when we have come to that point of view we have made progress. Toward that thing we are moving every year, the responsibility to the public for the character of the work we are doing, and when we have met that responsibility reasonably well, we shall find a grateful public recognizing our service and being ready to support us in the things that make for general public welfare.

Name Advisory Board For Dental College

At a recent meeting of the Dallas County Dental Society attended by members of the faculty of the State Dental College, a resolution was unanimously adopted accepting a proposition whereby the management and direction of the College is placed in the hands of an advisory board composed of Dallas members of the county society, as follows:

Drs. Bush Jones, J.W. Halsell, A.L. Frew, S.L. Barron, J.R. Beachum, G. Waller Staples, J. J. Simmons and C. L. Morey.

After the meeting of the county society the advisory board went into session and elected the following officers: Dr. J. J. Simmons, president; Dr. Bush Jones, vice-president; Dr. C. L. Morey, secretary; Dr. J. W. Halsell and Dr. A. L. Frew new members of board of directors.

The Board will take charge of the management of the College at once.

NEW PUBLICATIONS

A Text Book of Operative Dentistry, by various authors. Edited by C. N. Johnson, M.A., L.D.S., D.D.S., Prof. of Operative Dentistry in the Chicago College of Dental Surgery; editor of the *Dental Review*. Third edition, revised and enlarged. Philadelphia; P. Blakiston's Sons Co.

This edition of Doctor Johnson's valuable work has been carefully revised and much new matter added, including chapters on "The Treatment of Impacted Lower Third Molars," and "The Application of the Roentgen Ray to Dentistry," contributed by Dr. C. Edmund Kells, whose excellent work along these lines makes him an authority on these subjects.

The subject matter as revised and addition of the new material rounds out the work into a more comprehensive treatment of the entire subject of operative dentistry.

The popularity of the work is shown by the number of editions printed since the appearance of the first, in 1909. Since that time there have been three revised editions and four reprinted editions. Each chapter is written by a man of special ability, and altogether it is probably the most complete work on this subject that we have today.

Practical Oral Hygiene, Prophylaxis and Pyorrhea Alveolaris, by Robin Adair, B.S., M.D., D.D.S., Prof. of Oral Prophylaxis and Pyorrhea Alveolaris, Southern Dental College; Oral Surgeon Grady Hospital, Georgia Baptist Hospital, etc. Second edition, revised and enlarged; Atlanta, Ga., Oral Hygiene Publishing Co. Price, net $5.00.

The author states that this book is written for those dentists who desire practical information on the subjects of oral hygiene, prophylaxis and pyorrhea alveolaris.

The first section is devoted to the great forward movement of oral hygiene. Here are given methods and forms for dental inspection of school children, and a collection of carefully selected lectures furnishing the proper material for those called upon to deliver popular talks before school children and women's clubs. This section contains illustrations which may be shown and explained to a patient while in the dental chair.

The second section contains practical information concerning the most efficient methods to conduct prophylaxis in a dental practice, and names the materials to use for such work. The training of female assistants and the dental nurse question are treated in a most practical manner.

The third section is a comprehensive description of pyorrhea alveolaris. Here is described in detail the methods of treatment now prominent before the dental profession. The business phase of the question, so seldom mentioned in discussion or literature, is presented in a frank manner.

The entire subject matter in this second edition has been carefully gone over and brought up to date. The author calls particular attention to the enlarged chapters dealing with dental inspection and clinics in schools. Several new lectures have been added to the chapters on Popular Lectures. The third section of this work has been rearranged and all chapters enlarged. An important addition is a more detailed description of the latest findings in regard to the bacteriology and parasitology of the pyorrhea mouth. The endameba buccalis has received full attention.

A large number of new illustrations and an index of the subject matter and an author's index have been added.

From start to finish it is an interesting and practical book, and one every dentist should possess.

The Principles of Bacteriology. A practical manual for students and physicians, by A. C. Abbott, M.D., Professor of Hygiene and Bacteriology and Director of the Laboratory of Hygiene, University of Pennsylvania. 12mo, 650 pages, with 113 illustrations, 28 in colors. Cloth, $2.75 net. Lea & Febiger, Publishers, Philadelphia and New York, 1915.

The revision of this book has been so thorough that this ninth edition is substantially a new work.

There have been remarkable developments of bacteriological science and the author has reviewed the whole subject from the most modern viewpoints, so that the book includes all recent advances of proven value, has eliminated all obsolete and unessential material and greatly elaborated his work.

Concise statement, clear expression and the elimination of theoretical considerations in favor of essentials constitute this a working manual whose usefulness will impress itself more and more on the practitioner or student as he avails himself of its guidance. Every step in every process is made clear. The details of laboratory equipment and the use and value of apparatus receive careful attention. The minutiæ of laboratory technic are presented in complete but not burdensome detail.

Historical notes, which are not too profuse, stimulate interest in the study, and aid in the comprehension of the subject by showing the steps in the development of modern bacteriology. The author's emphasis on the applications of bacteriology in etiology and preventive medicine is a point of peculiar value. The sections dealing with the physiological functions of bacteria are most enlightening, and the latest knowledge of complement fixation, hemolysis and the reactions of immunity is adequately presented. The diagrammatic illustrations accompanying this section are a substantial aid to its understanding.

Alveolodental Pyorrhea. By Charles C. Bass, M.D., Professor of Experimental Medicine and Foster M. Johns, M.D., Instructor in the Laboratories of Clinical Medicine at the Tulane University Medical College, New Orleans, La. Octavo volume of 167 pages, with 42 illustrations. Philadelphia and London: W. B. Saunders Company, 1915. Cloth, $2.50 net.

The authors state that the object of this book is to present the subject in a simple, concise way, in the light of recent information. No attempt has been made to include a review of the literature on the subject except in so far as it may seem essential in presenting the present view.

The authors describe the etiology of alveolodental pyorrhea, attributing the specific cause to endameba buccalis. Other chapters deal with Morbid Process, Contagiousness, Symptomatology, Diagnosis, Treatment, Prophylaxis. The idea conveyed by the text is that the endameba buccalis is the specific cause of alveolodental pyorrhea, and that emetin is a specific cure.

Little attention is given to instrumentation as a part of the treatment of the disease.

The description of parasitic endameba and the effect of emetin upon them and upon the human economy is good, but in the light of practical experience with emetin in pyorrheal conditions, the great majority of dentists are not yet convinced that the emetin treatment is the only essential in the amelioration or cure of this disease.

The book, however, contains much information, and is well worth reading. The authors state that "the book is intended to be of practical use to both physician and dentist. It is also believed that many of the more intelligent laymen will find it a convenient source of information as to the nature, and especially the prevention, of this disease from which all sooner or later lose their teeth, if they live long enough."

Dorland's American Pocket Medical Dictionary. Edited by W. A. Newman Dorland, M.D., editor "American Illustrated Medical Dictionary." Ninth edition, revised and enlarged. 32mo, 691 pages. Philadelphia and London: W. B. Saunders Company, 1915. Flexible leather, gold edges; plain, $1.00 net. Thumb index, $1.25 net.

This neat little book contains the pronunciation and definition of all the principal terms used in medicine and the kindred sciences, including dentistry, veterinary medicine, nursing, etc., and includes more than sixty extensive tables.

The selection of words has been made as complete as possible, and the dictionary will meet all ordinary demands. Although it contains about 700 pages, it is so small it can be readily carried in the pocket. A convenient and useful little book.

Federal Narcotic Record Book for Physicians, Dentists and Veterinarians. Published by The Abbott Alkaloidal Company, Chicago. Price, 25c postpaid.

This little book contains an accurate and practical digest of the Federal Anti-narcotic Law, as it affects physicians, pharmacists, dentists and veterinarians, covering the following points:

Who Are Affected by the Law; With What Drugs the Law is Concerned; The License and How it is Secured; Routine to be Followed in Ordering Drugs; How the Bill Affects the Prescribing of Narcotic Drugs; Returned Goods; Inventories of Narcotic Drugs and Penalties.

This Digest has been pronounced by a Government Official the best he has seen.

The book contains 100 pages arranged, in compliance with the law, for the keeping of records of drugs dispensed or distributed, and permitting of 1,000 individual entries. There are forms, also, for the inventory and affidavit of inventory—a most complete and comprehensive record system.

Properly kept, this system—the most convenient yet devised—fulfills all the requirements of the Federal Anti-narcotic Law. It incorporates many new features and eliminates the weak points in other systems.

EDITORIAL

Ohio State Dental Society

The semi-centennal meeting of this society will be held in Columbus, Ohio, Tuesday, Wednesday, Thursday and Friday, December 7, 8, 9, 10, 1915.

An unusually strong program is being prepared and the meeting promises to be the best, and the largest attended of any ever held.

The Miller memorial unveiling will take place at this meeting and many distinguished dentists from other states are expected to attend.

See the partial program presented on an advertising page in this issue of THE SUMMARY.

File Your Protest

Acting under a ruling of the Attorney General, issued several months ago, State Insurance Commissioner Taggart has ordered Insurance Companies to discontinue writing liability insurance in Ohio. Most of the companies have already returned premium balances to their policy holders.

The legislative committees of the State Medical and State Dental Societies will file protests with Judge Taggart setting forth reasons why this ruling works a serious hardship on physicians, surgeons and dentists who have been carrying this insurance.

Every dentist having one of these policies should protest direct to Judge Taggart, State Insurance Department, Hartman Building, Columbus, Ohio, and do it at once.

SOCIETY·ANNOUNCEMENTS

Southwestern Michigan

The next meeting of the Southwestern Michigan Dental Society (3d and 4th Dist.) will be held in the Chamber of Commerce Rooms, Battle Creek, Mich., on Tuesday and Wednesday, Nov. 16-17, 1915.

R. A. Bowie, *Secretary,*
Three Rivers, Mich.

North Carolina State Board

The next meeting of the North Carolina State Board of Dental Examiners will be held at Salisbury, N. C., beginning promptly at 9:00 o'clock on Thursday, January 13, 1916. For further information and application blanks address the Secretary.

F. L. Hunt, *Secretary,*
Asheville, N. C.

Iowa Dental Society

The Northwestern District of the Iowa State Society will hold its annual Clinic and Manufacturers' Exhibit in the Martin Hotel, Sioux City, Iowa, November 23d and 24th, 1915.

New Jersey State Board

The State Board of Registration and Examination in Dentistry of New Jersey hold their semi-annual meeting and examination in the Assembly Chamber at the State House, Trenton, N. J., on December 6, 7, 8 and 9, 1915. License fee, $25. Re-examination fee $10.

Applications must be filed complete ten days before the date of the examination. Address all communications for further particulars to the acting secretary.

John C. Forsyth,
430 E. State Street,
Trenton, N. J.

Minnesota State Dental Association

Dr. Samuel A. Beecher, of St. Paul, Minn., died Sept. 18, 1915.

Dr. Beecher was born in Washington, Mo., in the year, 1843. He graduated from the University of Pennsylvania and located in St. Paul in 1867, where he practiced his profession until his retirement, six years ago.

Resolutions

October 7, 1915

The members of the Minnesota State Dental Association wish publicly to express their sorrow in the death of their friend and associate, Greene Vardiman Black, and to that end resolve:—

That the loss of a teacher so zealous in the cause of science, so warmly human in his devotion to the best interests of his students and his fellows, so distinguished in his far-reaching influence upon the standards and ideals of scientific education, is irreparable to the profession of dentistry.

That the warmest sympathy be extended to his family in their great bereavement.

That a copy of these resolutions be spread upon the minutes of the Minnesota State Dental Association, a copy sent to the family of the deceased, and a copy be sent to the various Dental Journals.

GLEN F. ANDREWS, *Chairman*
ROBERT WILSON
ALFRED OWRE

Mutual Protective Alliance

The question of protecting dentists against process patents is one in which the fraternity in general should be interested. It is a vital issue that must be faced sooner or later by every member of the profession.

Our attention has been called to the magnitude of the defense of the Taggart suits, recently on trial at Chicago. Testimony was taken for twenty-four days in this case, it was then adjourned for the usual summer vacation and will in all probability be up again for final test in late fall. When one realizes that in securing such evidence as has already been presented, the attorneys for the defense traveled over twenty-one states, visiting more than two hundred persons in these various states, and that something like one hundred and twenty-five persons came from all over the country to be present at this trial as witnesses and to assist in the conduct of the case, some idea may be gained of the effort, time and money required to defend this sort of patent litigation.

It is argued that this in itself is the most forceful kind of a reason why any association that is to adequately protect dentists against such litigation should be a nation-wide alliance. Patents themselves are of national scope and none but a national organization can successfully cover the field.

The Dentists' Mutual Protective Alliance is assuming the burden and doing the work of ascertaining whether or not the Taggart patents are valid. Such a burden seems an unfair one to place upon a single locality when the results to be obtained accrue to the entire profession.

The Alliance is conducting an active campaign for increased membership. Its principal office is located at Room 741, Monadnock Block, Chicago, with which office all dentists interested in this subject are invited to communicate.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

WHAT IS DOING IN THE SOCIETIES

Ohio—Willoughby D. Miller Society

Newark, Ohio, Oct. 15.—The Willoughby D. Miller Dental Society of Licking and Knox counties, concluded their annual session held in this city yesterday, by enjoying a banquet last evening.

The afternoon session of the society was devoted to the reading of papers and discussions on painless methods and filling materials. The annual election also took place, the old officers being again chosen as follows:

President, W. H. Sedgwick; vice-president, R. L. McIntosh; recording secretary, C. L. Wyeth; corresponding secretary, E. V. Prior; treasurer, W. S. Deeley.

The president, Dr. Sedgwick was also elected a director in the Ohio State Dental Society.

The society is named in honor of the late Dr. Willoughby D. Miller, who was born in Alexandria, Licking county. Dr. Miller died in this city several years ago and his remains were interred in the Alexandria cemetery. Only last year the news gathering associations of the country carried a story that the German Emperor and German dentists would send representatives to this country to place wreaths on the grave of Dr. Miller. The breaking out of the war interferred with the plan.

At the banquet last evening Dr. W. H. Sedgwick presided as toastmaster and he made an ideal presiding officer. The guests were: Drs. C. L. Wyeth, E. V. Prior, J. D. Ford, Ed. Miller, A. V. Davis, A. W. Beard, J. H. McCahon, G. W. Bourne, C. D. O'Hara, J. T. Lewis, W. G. Corne, H. G. Withers and C. B. Keller of this city. L. E. Davis and J. W. Rohrer of Granville, C. W. Reelhorn of Pataskala and Drs. G. A. Beck, W. S. Deeley, R. L. McIntosh and W. S. Grossman of Mt. Vernon, H. S. Barrick, Newark.

The toastmaster called on the various members for short talks and a very pleasant hour followed.

During the course of the evening it was decided to attend the state dental meeting in a body and participate in the ceremonies incidental to the unveiling of a monument to the memory of Dr. W. D. Miller, which will take place at Columbus. The next meeting of the Licking-Knox society will probably be held at Mt. Vernon, in May, and they will be semi-annual affairs hereafter.

Ohio—Corydon-Palmer

Youngstown, Ohio, Oct. 14.—More than one hundred members of the Corydon-Palmer Dental society of Mahoning, Trumbull and Columbiana counties gathered at the Ohio hotel Thursday for the annual fall meeting.

The morning session beginning at 9:30 a. m. consisted of table clinics on various operations of dentistry, conducted by Drs. C. E. Ludt, W. H. McCreary, W. H. Hayden, H. P. Braham, H. W. Zellers, F. E. Renkenberger, and F. W. Zimmerman of this city; H. D. Warren and J. B. Reeves, of Warren; E. E. Dyball, of Salem, and C. A. Brennan, of Sharon, Pa.

The afternoon session beginning at 2:30 p. m., consisted of a business session lasting half an hour and given over, or the most part, to the election of officers: a lecture by Dr. J. P. Henahan, of Cleveland, on the subject, "Conductive Anesthesia," accompanied by a chair clinic, and followed by discussions by Drs. J. L. Gilmore, of Youngstown; and E. E. Chambers, of Warren.

Ohio—Lorain County

Elyria, Ohio, Sept. 16.—The Lorain County Dental Society held its first meeting of the season at the Country Club, Tuesday evening, when twenty-one members engaged in a 6 o'clock dinner.

Following the dinner a business meeting was conducted and officers elected for the ensuing year.

Dr. W. H. Whislar, of Cleveland addressed the meeting and discussed the newer phases and treatment of pyorrhea alveolaris, or Riggs' disease which is so prevalent.

The following officers were elected: President, J. E. Barnard, of Oberlin; vice-president, J. E. Betteredge, Elyria; recording secretary, C. K. Love, Lorain; corresponding secretary, A. R. Agate, Elyria, and treasurer, J. E. Trombley, Lorain.

F. C. Hoffer, the retiring president, was selected as delegate to the Ohio State Denta-meeting to be held in Columbus in Del cember.

Ohio—Northwestern

Lima, Ohio, Sept. 23.—The first fall session of the Northwestern Ohio Dental society was held last night at the Lima House with 16 members of the association present. Following 6 o'clock dinner the society was addressed by Dr. Bruzelius and Dr. Jones. "Office Helps" was the subject of the discussion between Dr. Gray and Dr. Kirkland. In addition to the members, the following guests were present: Dr. A. S. Brunk, LaJunta, Colo., and A. C. Lugabill of Bluffton.

Indiana—Northern

Bluffton, Ind., Oct. 8.—The twenty-seventh annual meeting of the Northern Indiana Dental Society, which opened in this city Thursday for a two days' session, was attended by more than 300 dentists. Addresses were delivered yesterday by Dr. W. Leroy Myer, of Rensselaer; George E. Harter, Toledo, and Dr. C. M. Mix, of Muncie. In the evening the dentists were guests at a local theater.

Dr. O. U. King, Huntington; Dr. W. S. Walters, Lafayette; Dr. G. B. Martin, Frankfort; Dr. E. A. Kiplinger, Columbus, O.; Dr. J. V. Howard, Indianapolis, and Dr. E. J. Greenfield, Wichita, Kan., had charge of clinics held this morning. Later the dentists and their wives went by automobiles to the Geneva home of Gene Stratton Porter, the novelist. A trip was also made through the Limberlost.

Officers elected were: Supervisor of clinics, A. L. Harter, of Kokomo; president, O. A. Van Kirk, of Kendallville; vice-president, F. A. Wildason, of Eaton; secretary, C. A. Priest, of Marion; secretary L. W. Dailey, Bluffton; registrar, Fred Houk, Huntington.

The committee on necrology reported eight deaths among northern Indiana dentists and also presented a memorial resolution on the death of Dr. G. V. Black, dean of the dental school at Northwestern university, to whom many of the members of the society are indebted for a portion of their education.

The meeting next year will be held at Kokomo. All papers and discussions will appear later in THE DENTAL SUMMARY, official magazine of the society.

Then the Row Started

Mrs. Snappem (who has been suffering from toothache)— Thank goodness, I've had that tooth out at last!

Mr. Snappem—Happy tooth!

Mrs. Snappem—What do you mean?

Mr. Snappem—It's out of the reach of your tongue.

Indiana—Indianapolis Outing

Indianapolis, Sept. 19.—Members of the Indianapolis Dental Society held their first outing yesterday on White River at Horseshoe Bend, near Noblesville, Ind. The afternoon was given over to horseshoe games, croquet, target shooting and other pastimes. After a chicken dinner several brief addresses were given. The speakers were Dr. A. R. Ross of Lafayette, Ind., secretary of the Indiana State Dental Society; C. E. Redmond of Preu, Ind., member of the state board of medical examiners; Dr. N. W. Hiatt of Marion, Ind., who discussed the meeting of the Wabash Dental Society at Bluffton, Ind., in October, and Dr. T. A. Kimberlin of Indianapolis, senior member of the board of directors of the Indianapolis society, who planned the outing. Dr. C. R. Jackson of Indianapolis, president of the Indianapolis Dental Society, presided. The regular monthly meetings of the society will be resumed in October.

Indiana—Evansville

Evansville, Ind., Sept. 25.—Evansville will have a free dental dispensary in the near future if the efforts of Mayor Bosse and a committee of five dentists chosen by the Evansville Dentists' Association are successful. An ordiance appropriating $100 a month, ten months of the year, for the purchase of supplies and the remuneration of an interne, probably will be presented at the next session of the city Council.

Doctors Arthur Rietz, John Zubrod, Sidney Jacobi, R. J. Morris, A. J. Kimm and Victor Knapp, Friday, were in conference with Mayor Bosse and furthered plans for the new clinic, which probably will be located in the city hall.

It was decided that three representative dentists shall be chosen, who will give their services to the clinic. One of the three shall be in attendance at the clinic each afternoon, to assist the interne and supervise the work.

The present clinic in the Rookery building has been rushed with work, and it is intended that the new dispensary shall be more far reaching and embrace a much broader field. Parents of school children who require the services of a dentist will be free to choose any one they desire, or the children will be treated free in case of need.

Illinois Board Completed

Springfield, Ill., Oct., 15.—Governor Dunne today appointed Dr. J. K. Conroy of Belleville and Dr. J. W. Elder of Eldorado to be members of the State Board of Dental Examiners, to succeed Dr. M. W. Cox of Champaign and Dr. D. A. Smith of Cairo who resigned under fire. Today's appointments complete the board.

Illinois—Eastern

Charleston, Ill., Oct. 14.—Dr. W. H. Barnfield of this city was chosen as president of the Eastern Illinois Dental Society for ensuing year, the election of officers having been completed just before adjournment on Wednesday evening of the annual gathering of the society in this city. C. L. Rice of Tuscola was named vice-president, G. L. Kennedy of Villa Grove, secretary, W. B. Lamb of Casey, treasurer and W. A. Wright of Oakland, librarian.

The meeting was largely attended, and the program was one of the best the society has participated in for several years.

Iowa—Oshkosh—Winnebago

Oshkosh, Wis., Oct. 14.—The Oshkosh Dental society and the Winnebago-Outagamie County Dental society held meetings last evening at the Oshkosh Elks' club. The Oshkosh organization had its business meeting first, while the latter society, which is a component part of the state dental society, convened at 8 o'clock. Both events were preceded by a dinner served at 6:30 in the club dining room, which had a large attendance.

Election of officers was held for both societies, the results for the Oshkosh men's meeting being: President, A. C. Gifford; vice-president, G. A. Gehbe; secretary and treasurer, John F. Mortell. Dr. C. C. Finney was elected to the board of censorship for three years, which body has charge of arrangements and programs for meetings.

The Winnebago-Outagamie society elected officers as follows President, J. M. Donovan, Appleton; vice-president, C. C. Finney; secretary and treasurer, A. C. Gifford. There was also a committee of three appointed to arrange for a clinic at the next gathering, scheduled for the second Tuesday of February.

Arkansas—Southeastern

Dr. E. J. Logue of Arkansas City was re-elected president of the Southeast Arkansas District Dental Association at the annual meeting which closed with a banquet at the Hotel Pines. The other officers are. S. L. Jones, Thornton, vice-president; T. C. Edgar, Pine Bluff, secretary-treasurer; J. C. O'Daniels, Pine Bluff, corresponding secretary. Dr. Elbert Stewart of Little Rock was a guest of the meeting and was made an honorary member. Dr. H. J. Crume of Hamburg delivered an address on "The Credit System in Practice."

Detroit now has eleven free school dental clinic in active operation, under the management of Dr. B. R. East. Orthodontia has been added to the regular treatment.

A GREAT DENTIST'S MONUMENT

The late Dr. Greene V. Black Accomplished a Work Which Will Remain His Lasting Memorial

The recent death of Dr. Greene V. Black was a source of particular sorrow to many of the dentists of Central Illinois, many of whom had been under his instruction during their college days. The Jacksonville Journal editorially said of him:

"It is written that men are known by their works. Judged by this high standard Dr. Greene V. Black, who recently closed his long life, was a man of giant stature. Almost in his boyhood days he gave earnest of his strength of mind which later was to make him famous the world over. Thus for more than fifty years he made written contributions to the text books and literature of dentistry and this valuable work continued until early in the present year.

"One who knew him well said yesterday that it was the intense interest in his work that enabled him to maintain his strength of mind and body all through the years and nearly until the end of the journey. He worked many hours each day and far into the night. When engrossed in experimental work or in writing he seemed to forget all else and no matter of personal comfort occurred to him.

"Some men in their special work, great as it may be, have their own interests somewhat in mind also and seek wealth and position. Dr. Black had no thought of self in his activities but was occupied in a broad way in his endeavor to develop the science in which he was so much interested and sought through his development work to blaze the way for other workers in the profession and thus to give aid to humanity.

"While it was given to him to have encomiums heaped upon him because of his research work, his inventions, his writings, for him the fact that he accomplished things was sufficient reward. In later years just as was true in the earlier years he was readily accessible to anyone interested in the problems of dentistry. Fame brought to him no austerity of manner or spirit and he preferred to consider himself a humble worker who had accomplished some things but who realized that there were many more things worthy of accomplishment. Dr. Black's work has circled the globe. It is his monument and will endure."

Head of Grand Rapids Clinic

Grand Rapids, Mich., Oct. 1.—The board of health last night appointed Dr. James F. Spencer to take charge of the dental clinic for the current year. Elsa Boorsma was appointed clerk of the clinic in place of Esther Brown, who has resigned.

Dr. King Offered Unique Position

Dr. Otto U. King, of Huntington, Ind., Secretary National Dental Association, no end of a good fellow and several other things, has been offered the position of superintendent of the Eastman dental dispensary which is being built at the expense of Mr. Eastman for the city of Rochester and for the use of all school children free of charge. The building for the dispensary will cost about $300,000, of which sum $10,000 is subscribed by other citizens of Rochester and the city itself must agree to defray the expense of all professional help needed in the place for five years, or about $12,000 yearly.

As the head of the institution Dr. King will have absolute command of all the other employes of the place. He has not yet announced whether he will accept the place offered him but said that he was favorable impressed with it.

American Academy at Detroit

Detroit, Mich., Sept. 23.—Advanced clinical research was conducted Wednesday morning at the office of Dr. E. B. Spalding by the American Academy of Oral Prophylaxis and Periodontology, which has been in convention this week at the Hotel Statler. At the afternoon session there was a continuation of the technical discussion and the election of officers was held. The officers are: William Gillette Hayden, Columbus, Ohio, president; J. O. McCall, Buffalo, N. Y., first vice-president; J. J. Sarrazin, New Orleans, La., second vice-president; J. Herbert Hood, Cleveland, Ohio, secretary; H. J. Stewart, New York city, treasurer; A. J. McDonagh, Toronto, Can., and Paul Stillman, New York city, members of the council.

Dinner to Dr. Lyons

Jackson, Mich., Sept. 11.—W. D. McWilliams gave a dinner Friday evening at Michigan Center in honor of Dr. C. J. Lyons of this city.

A delicious dinner, including chicken and frog legs, was served. John Maher presided over an interesting toast program which included talks and music. The principal address was given by Dr. Fowler of Battle Creek. W. D. McWilliams also made a few remarks.

Among those present were Drs. C. J. Lyons, J. W. Lyons, Kugler, Gibson, Howlett, Taylor, Merritt, Ed.R. Hague, Thos. Cowherd, George B. McQuellan, Claude McQuellan, Alex. Tawse, Frank H. Newkirk, John Maher, Hammett, Cowley, McClellan Fackelton, McWilliams, Beebe, Hitchcock, Mitchell, Peterson, Seybold, Fowler, Battle Creek, and Darling AnnArbor

Missouri State Dental Board

Jefferson City, Sept. 21.—Governor Major today appointed the five members of the state dental board, each to serve for a period of five years from September 6, 1915. The list follows: T. E. Purcell, Kansas City; George E. Haig, Jefferson City; Jesse Miller, Maryville; W. A. Roody, St. Louis, and V. R. McCue, Trenton. All are reappointments except Doctor McCue, who will succeed Dr. Charles A. Brown of Edina.

A New State Director

Urbana, Ohio, Sept. 23.—Dr. T. T. Brand, Jr., of this city, was elected director of the State Dental society at a meeting of the Dental Association held in Springfield Tuesday.

Dental Training by Pegs

"Fifteen years from now, if I have any teeth left for anybody to fool with, I shall hire a certain Chinese boy to do the fooling," a city salesman said. "He will be grown up then. I saw him the other day down in Chinatown. He was pulling pegs out of a board with his fingers. The pegs had been driven pretty tight into holes in the board, and it took a good deal of strength to get them out.

" 'That is a funny game for him to play,' I said to a white man who knows the quarter.

" 'Game?' said he. 'That is not a game. The boy is going to be a dentist. His folks have made up their minds about that, and he has commenced early to strengthen his fingers. They train them that way in China because there they pull teeth with the fingers. He will not pull with his fingers here, but the strength and skill will come in handy, just the same.' "—*New York Times*

Teeth That Won't Stop Growing

One of the most extraordinary cases known to dental science is that of a Virginia man whose teeth won't stop growing. About five months ago he discovered that his teeth were becoming longer and more prominent. He consulted a dentist, who advised him to have them trimmed. He did so, and soon after they began to grow faster than at first. He had them sawed off again, but they continued to grow. The best doctors were called in, but none can tell the cause of this strange affliction. At this time his teeth are almost an inch long and are turning backward in his mouth, so that eating is difficult; hence there are fears that the disease may result fatally.

THE DENTAL SUMMARY

THE MAGAZINE THAT HELPS

Vol. XXXV DECEMBER, 1915 No. 12

OFFICIAL ORGAN

The Ohio State Dental Society
The Michigan State Dental Society
The Indiana State Dental Society
The Kentucky State Dental Society
The Louisiana State Dental Society
The West Virginia State Dental Society
The Northern Ohio Dental Society
The Northern Indiana Dental Association
The Eastern Indiana Dental Society
The Southwestern Michigan Dental Society
Odontological Society of Western Pennsylvania
The Lake Erie Dental Society
and Several Local Dental Societies

Editorial Office: 195 16th Avenue, Columbus, Ohio
L. P. BETHEL, M. D., D. D. S., Editor-in-Chief

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Yearly Subscription, $1.00 in U. S. Canada $1.40.
Foreign, U. P. U. Countries, $1.75. **Advertising Rates on Request**

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REGULAR CONTRIBUTIONS

PRECANCEROUS CONDITIONS OF THE FACE AND MOUTH*†

BY JOHN W. MEANS, D.D.S., M.D., COLUMBUS

INSTRUCTOR IN SURGERY, THE COLLEGE OF MEDICINE, INSTRUCTOR IN ORAL SURGERY, THE COLLEGE OF DENTISTRY, WITH THE COLLABORATION OF JONATHAN FORMAN, B.A., M.D., INSTRUCTOR IN PATHOLOGY, THE COLLEGE OF MEDICINE, OHIO STATE UNIVERSITY.

CAREFUL STUDY OF CANCER occurring about the face and oral region has shown that in a vast majority of cases the lesions were primarily benign. In other words, there has been a stage in the evolution of the tumor in which the process of cellular activity was not other than the normal. To this early stage some one has applied the term, precancerous. A significant fact is that there are no time limits to this stage, as each individual lesion is a law unto itself and must be dealt with accordingly.

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*Read before the Columbus Dental Society, June, 1915.

†From the Clinics and Laboratories, Colleges of Medicine and Dentistry, Ohio State University.

There is nothing of as great importance to our patient as the recognition of a condition that may ultimately undergo cancerous change. One of the favorite locations for these pre-cancerous conditions is the region of the face and oral cavity. There are many small and inconspicuous lesions occurring in this locality to which the layman attaches little importance, but which are just the type that later result in cancer.

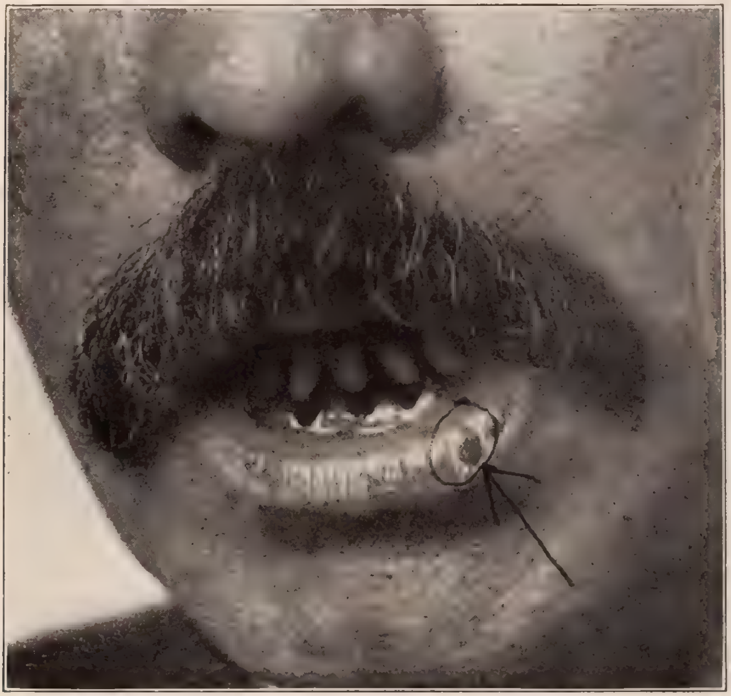

Fig. 1.—Smoker's burn of the lower lip.

Statistics show that something over 40,000 persons die annually in the United States from cancer; 1500, or approximately 2½% of these deaths are from cancer of the buccal cavity. Further, it has been estimated, that between 30% and 90% of cancers, depending upon their situation, are inoperable when first seen by the surgeon. This percentage is especially high in cancer of the lips and tongue. Now, when we contrast these figures with the knowledge that 80% of surgical cures can be made if taken in time and that this can be raised to nearly 100 when the attack is made in the pre-cancerous stage, are we not derelict in our duty when we allow such lesions to escape our most careful consideration?

Cancer in its broad sense is taken to mean a malignant tumor, irrespective of the kind of tissue from which it has originated. In this paper we will adhere to this meaning, for while most of the conditions we will consider are of an epithelial nature, yet the connective tissue furnishes us some important growths.

The average layman's conception of cancer is that of a growth which has come from no one knows where or why and which has roots and branches and grows by entwining its tentacles within the body tissues. He believes that dire calamity may result should he be so unfortunate as to come into actual contact with one. He cannot understand how a simple wart or blister could result in a disease that will surely and ruthlessly seal his doom.

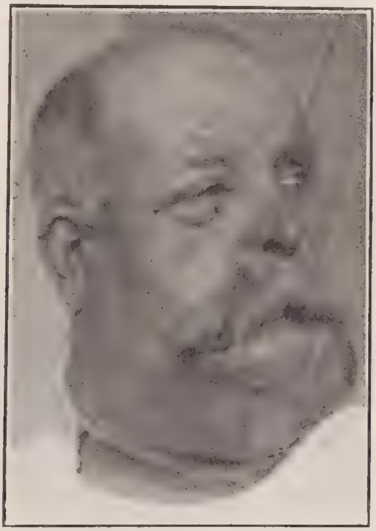

Fig. 2.—Advanced carcinoma which began at the bucco-gingival juncture.

We, who are familiar with cell growth, know the absolute fallacy and danger of such a belief, and therefore should be unceasing in our efforts to correct it by explaining to the unenlightened public the real nature of this pitiless enemy of mankind. We know that the cells making up such a tumor differ in no wise from the normal body cells except in their tendency to lawless and perverted growth. We also know that each individual is responsible for his own cancer; or in other words, that cancer is not transmissible.

When the cells of any tissue are injured or destroyed through some agency, it is the fundamental effort of nature to bring about repair. This is done by the elaboration of new cells from those in the immediate vicinity which were unharmed. Now, normally, the development of these newly formed cells is uninterfered with and they soon reach maturity, after which we say that healing has taken place. In some cases, however, due to an influence of which we as yet know but little, these cells do not reach their maturity but persist in a partially developed or embryonal state. They then continue the process of cell elaboration far beyond the necessary limits, in short, take on an ungovernable process of reproduction. Thus a group or groups of cells are formed which do not conform to any physiological law in their development, and to which the name *cancer* has been applied.

It will be seen, then, that in the beginning, the condition is one of reparative cell growth, or we might say, a normal effort, which, after reaching a certain stage, becomes a perversion and results in disease. Hence the cancer cell differs in no wise from one of the normal cells except that it has become diverted from its natural developmental course and never reaches maturity. This cellular activity explains one of the most significant features of cancer, namely, rapid growth.

One fact of the greatest importance is that in the beginning, i.e., the pre-cancerous stage, this disease is a purely local one and can be completely eradicated. However, due to its method and rapidity of growth, it soon becomes a general affection, after which its cure passes beyond the pale of human cure.

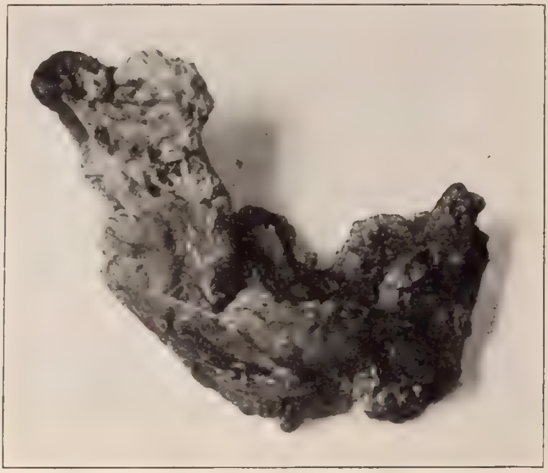

Fig. 3.—Carcinoma of the jaw.

The methods by which cancer becomes disseminated throughout the body are of greatest interest. Due to a close association with the lymphatic system, the cells in their growth soon extend through the smaller lymph spaces until the larger channels are reached, where the current of lymph carries them to the nearest nodes. Here they continue to proliferate and again produce a cancerous tumor. Sometimes the cells penetrate a small blood vessel and are carried to other locations by the circulatory route. These processes of distribution of the cancer cells from an original focus are termed *metastasis*, which is one of the pathognomonic characteristics.

The reason for apparently benign conditions assuming cancerous change is one of the mysteries that has remained unsolved. Many theories have been advanced but no satisfactory conclusion has been reached.

Traumatism has always been assigned an important role in the production of cancer about the mouth. The smoker's burn, the jagged tooth and the injury done by the chewing of the beetel nut have received a good deal of attention and no doubt, justly so. In considering trauma as a cause, however, it must be borne in mind that it is not the acute form that is meant. It has been proven that the only influence a bruise or injury has in the production of cancer is by causing a change in the tissues which results in a chronic irritation to the neighboring cells. The trauma referred to is of the persistent or chronic variety.

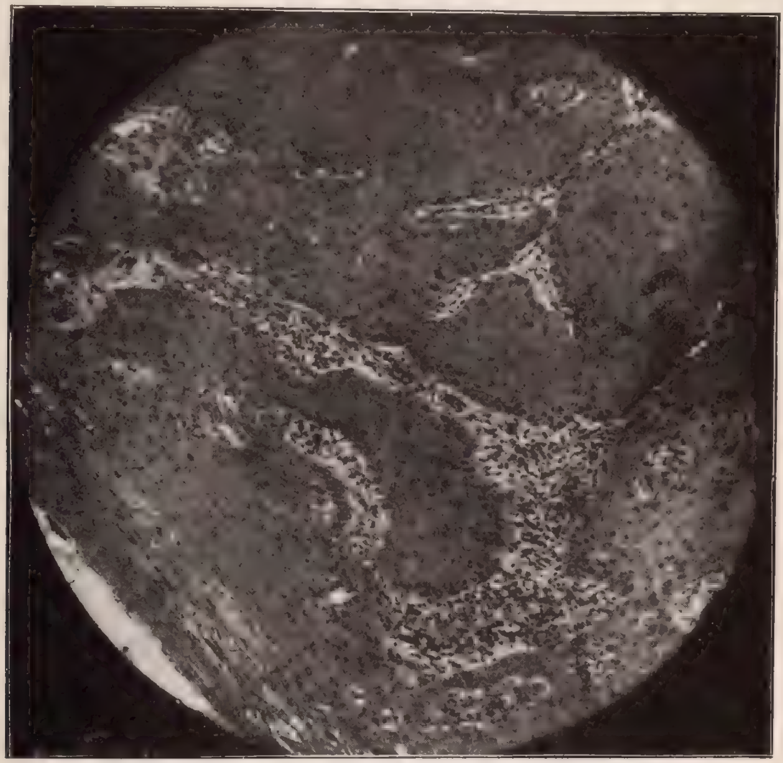

Fig. 4.—A photomicrograph of a section taken from an epidermoid carcinoma of the lip.

While the history of traumatism can be elicited in the majority of cancer cases, especially of the lip, there are many lips which are injured and do not develop cancer. This should make us all the more suspicious of recurring lesions and those which persistently refuse to heal. There must be some factor then which determines whether the reaction to a chronic irritation is to be the normal process of repair, or cancer. This factor, as was said before, is not known, but the recent work of Miss Slye appears to give us the clue. This worker has found that in mice, "cancer follows the laws of heredity with an inevitableness which makes it a character that can be manipulated. It can be bred in and out of strains at will. It can be put into a strain where it never existed before, and it can be drawn out in extracted lines which can produce nothing else, and which, in turn, will carry cancer into any line with which they are hybridized; or it can be bred out of a line, one side of which originally carried 100% cancer."

Cancer in mice is of the same histological structure as in man. There are a few differences as to the frequency in certain sites. Of interest to us is the fact that cancer of the oral region in mice is not common. Injury to these parts is also infrequent in these animals, whereas it is common in man. Overgrowth and consequent pressure of an irregularly placed tooth or a wound caused by fighting, or by being hurt in the cage, are the only two forms of injury done to the experimental mouse, so that it would seem that the elimination as far as possible of all forms of injury or over irritation to the tissues of an individual of high cancerous ancestry, goes far to eliminate the provocation of cancer.

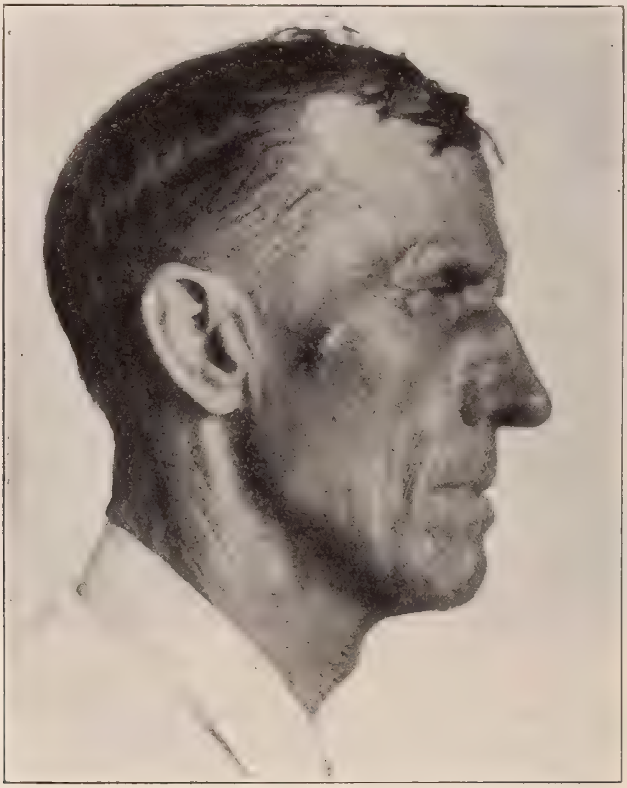

Fig. 5.—An early epidermoid carcinoma of the cheek.

In such conditions as warts and moles, which are not due to trauma and which take on cancerous change after many years of benignity, the reason is still harder to ascribe. It is a well recognized fact, however, that the cells composing such growths are in a state of the utmost instability, and it requires but slight irritation to start up proliferative activity.

It is not the purpose of this paper to enter into a discussion of the histo-pathology of these malignant tumors. However, a few words as to the more common types might be apropos. From the epithelium and epithelial composed structures we have two forms of malignancy, differing only in that one originates from the superficial layer of cells in the skin and is called *epithelioma*, and the other from the cells lining the hair follicles and is termed *baso-celled carcinoma*. Generally speaking, however, the terms carcinoma and epithelioma are used synonomously and refer to any type of malignancy arising from epithelial cells. A malignant tumor arising in structures other than the epithelium, i.e., the connective tissues, is termed a *sarcoma*. There is no difference in the end result between carcinoma and sarcoma, both being equally rapid and relentless in their destruction of life.

Of greatest interest from a clinical viewpoint is the symptomatology incident to the pre-cancerous stage, for after the malignant change has become firmly established, the diagnosis is a matter of greatest ease, but the chances of benefit to the patient are practically gone. What then is to be our guide in their diagnosis?

Cancer of the oral cavity occurs more often in men because of the greater frequency of smoking and the greater liability of exposure to injury which may result in chronic irritation. It is rare before the age of 35, although the benign growth from which the cancer originates may develop earlier.

The beginning of the disease may be a burn on the mucocutaneous junction of the lips, brought about by smoking. A small blister forms, which may entirely disappear, then show a tendency to re-form. Often the contact with a pipe-stem will cause adherence of the epithelium, which will be torn off with the removal of the pipe from the lips. Again it may appear as a fissure or crack in the lips or may be a small ulcer on the mucous membrane produced and chronically irritated by a jagged tooth. At first a scab forms, which is often pulled off by the patient, leaving a depressed ulcer with a dark center. This does not heal readily and soon becomes a source of much annoyance. He very commonly keeps up an irritation by biting or applying his tongue to it. Finally it begins to enlarge and he often resorts to the use of cauterization or the application of some irritating medicament.

The causative relation of chronic inflammatory diseases of the mouth, such as pyorrhea alveolaris, to cancer, must be mentioned as this is now receiving considerable attention from investigators.

The condition may persist without visible change for some time or may gradually spread as the result of continued irritation until a larger ulcer is formed. This is usually an irregular lesion, rather deep and having hard and everted edges. The base is smooth and grayish in color. There is often a thin irritating discharge. Around the edges is a zone of bluish discoloration containing dilated vessels.

Persistency, or a tendency to heal and then to reappear, is a significant warning as to the probable nature of the lesion and when found in a person of the cancer age, should always be removed. The exact time at which the cancerous change takes place cannot be determined. It may exist for a few years—rarely over five—in a benign condition, then suddenly develop malignant changes and progress rapidly.

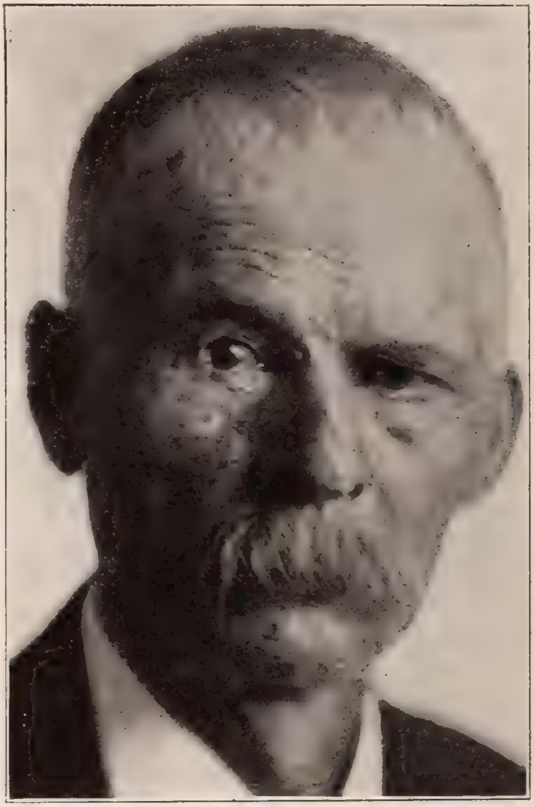

Fig. 6.—Basal-celled carcinoma at inner canthus of right eye.

But this is not the only way in which these pre-cancerous conditions present. Not infrequently a wart or papilla may have been present on the face or about the oral cavity for many years. It has given no serious trouble other than local discomfort, nor has it increased in size, when suddenly a change takes place and its growth commences. After the age of 35 such activity should be viewed with suspicion and the slightest change either in size or in character should be met by immediate complete extirpation.

Of particular interest to the dentist is the pre-cancerous tumor arising in the alveolar connective tissues and known as *EPULIS*. The early signs of this tumor are somewhat more difficult to recognize, in that they are almost entirely of a functional nature, no visible growth being present. It is most often found in children and young adults, with no special predilection for either sex or either jaw. It occurs in two types, a fibrous or hard, and a giant cell, or soft. Of the two types, the giant cell epulis is more common.

The symptoms are usually divided into two stages: *First*, that in which the tumor has not yet made its appearance to the naked eye, and *Second*, that in which the presence of the tumor has become established. During the first stage, disturbances of function, pain of neuralgic character, usually localized to one or more teeth and a tenderness of these teeth to pressure are noticed. As the tumor grows, it will gradually push the tooth or teeth above the level of the surrounding teeth. This stage may extend from a few weeks to several months, when finally the tumor will gradually become visible. In the second stage, there is, in addition to the functional symptoms; the presence of the growth. There is not often great tenderness or pain in the tumor itself.

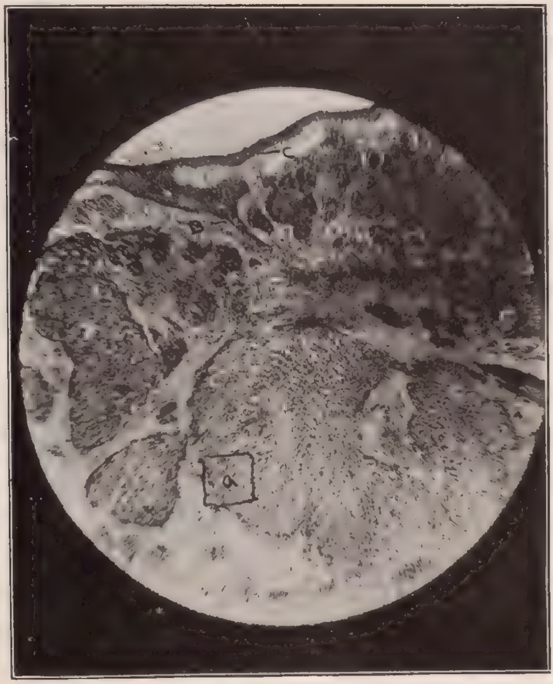

Fig. 7.—A basal-celled carcinoma of the cheek.

In appearance, epulis is a rounded tumor of variable size, although usually small. It is flattened and reddish. The fibrous type is hard and firm while the giant cell type is soft, due to its vascularity. It is situated on the alveolar border and usually appears first on the inner side. It may gradually extend and involve several teeth. In its growth it may involve other structures of the mouth, but usually has a tendency to remain more or less localized. In the later stage, it may produce great deformity. The fibrous type is particularly slow growing while the vascular giant cell type is more rapid.

The prognosis in any of these conditions is in direct proportion to the earliness at which they are recognized and treated. When removed, while yet benign, one hundred per cent. of cures can be promised. But who is to know at what time malignant change takes place? Some lesions may have existed for years without alteration and suddenly develop marked activity; some may never assume malignancy. After cancerous perversion has developed, the percentage of cures rapidly decreases, due to the fact that a rich lymphatic supply in this region makes metastasis an early complication. In the examination of such a patient, the doctor should not fail to note the condition of the sub-maxillary, sub-lingual and parotid lymph nodes, as this may give him an index to the extent of the involvement and make him more guarded in his prognosis.

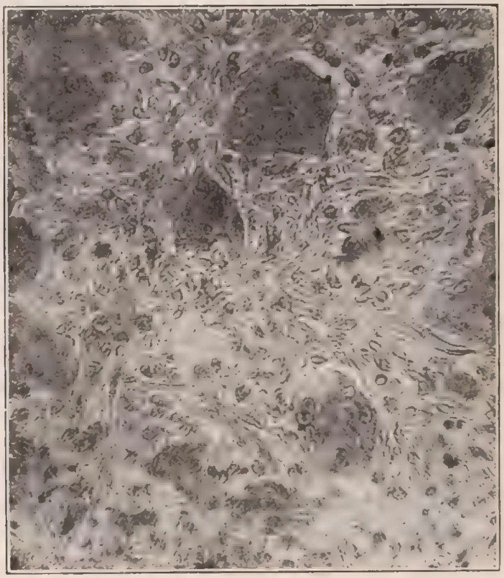

Fig. 8.—Giant cell epulis.

The treatment of any pre-cancerous lesion is, of course, removal. Naturally the selection of method is a factor. The employment of means other than surgical is only applicable to a limited field. Warts and papillæ and perhaps moles may sometimes be removed by a process known as desiccation. This requires a special electrical apparatus and more or less experience in its use. An electric spark is applied directly to the growth until it becomes completely destroyed. The stimulation of cauterization serves only to increase the cellular activity and recurrence promptly takes place. These recurrences are always much more malignant than the original tumor. The same fact can be said of incomplete surgical removal.

There is only one safe and sane means of completely eradicating these lesions and that is by complete extirpation. The advantages of this method are many and the disadvantages none. A few drops of a local anesthetic serve to make the operation painless and the patient leaves with a feeling of security which it is not possible to give by any other method. The removal in the pre-cancerous stage is not a disfiguring operation in any sense, an advantage which cautery does not give.

After cancer has developed, there is but scant hope for cure and this is only through extreme surgical intervention. This means, along with the removal of the local growth, the dissection and removal of all enlarged lymph nodes and lymph-bearing tissues, which is not only a formidable but disfiguring procedure.

Let us then sum up some of the most salient points that we have gained in the study of these conditions:

First: Most cancers of the face and oral region have in the beginning passed through a benign stage which is termed pre-cancerous.

Second: One of the most significant things in the study of cancer is the fact that the cells making up this growth in no way differ from the young cells which are normally elaborated to repair any defect.

Third: There are certain conditions which are commonly benign but which are very prone to become malignant.

Fourth: We cannot tell which one will become cancer and which will remain benign; nor can we tell the time at which the change has occurred.

Fifth: One hundred per cent. cures result from removal in the pre-cancerous and even the early cancerous stage and a rapid decrease in this percentage follows procrastination.

Sixth: Removal by surgical means is by far the safest method and is practically without disfigurement or inconvenience.

In conclusion, then, let me emphasize the thought that the responsibility of the dentist is greater than that of the physician in that his work brings him in more frequent contact with the lesions of the oral cavity.

U. of M. is considering compulsory military training for all students. Should be a part of the course in every school and college, beginning with primary grades, progressing as other studies progress. Every man in America should be a potential soldier.

PORCELAIN-FACED MOLAR CROWN.

BY R. J. RINEHART, D.D.S., KANSAS CITY, MO.

GOULD'S MEDICAL DICTIONARY defines Mechanics as the science that treats of the influence and effects of force upn matter.

Mechanics then is a science, and science is absolute knowledge, the collection and application of general principles.

Then to be scientific dentists we must possess a knowledge of the influence and effects of principle, or the fundamental truth, the governing law, and be qualified to exercise this knowledge in practice.

The principle of all right ideas has always existed, and we as dentists find it our privilege to unfold useful ideas, working them out according to a definite principle.

Dr. Black has set forth the idea in cavity preparation of flat seats and parallel walls, which is proving to the profession by the results obtained that the idea is scientific.

Flat seats and parallel walls are equally applicable in crown work as in filling, and the most accurately prepared tooth or root is the one upon which a crown when seated rests securely before cemented.

Dentistry is a science and an art, and any piece of work that is constructed according to mechanical principles, and is artistic in appearance is one which gives the greatest amount of satisfaction to both patient and practitioner. The time is not far past when gold crowns were not considered so very objectionable, and many argued greater service in their favor. The porcelain crown and facing have proven to the profession that service as well as esthetics is in their favor when properly constructed by the manufacturer and used scientifically by the dentist.

As necessity is the mother of invention so dentistry has forged ahead with unceasing energy, finding new methods as well as new materials.

The entire elimination of the appearance of gold from the mouth is unquestionably a foremost thought in the mind of the dental artist, and this has been successfully accomplished in crown work back to the first molar. The temptation to construct a gold crown for the superior first molar is largely due to the lack of some definite method of scientific construction which would be easily accomplished. Really no piece of dental work is so accomplished until we have a complete understanding of the technic and carry that technic out to the last letter. When it is understood and mastered, it becomes the easiest way.

Now the crown I wish to describe may be made for both bicuspids and molars, preferably superior, having a porcelain face extending to the gum margin, also to the cutting edge allowing no gold to mar its beauty. Its cusps and lingual side is of gold, so it may serve as an anchorage for a bridge, giving the maximum strength. Other claims in favor of this crown are its strong anchorage upon the tooth, having much tooth substance left standing and no long pins extending into the roots, necessitating the enlargement of the canals, consequently the weakening of the roots. This crown is rested upon a flat seat and the portion left standing may have almost parallel walls. When placed upon the tooth before cementing, no pressure from any angle will rock it.

PREPARATION OF TOOTH

The tooth must be devitalized and roots properly filled. Grind off the cusps sufficiently for any substantially crowned tooth; cut the buccal wall down to the gum margin and extend it back to the lingual wall of the pulp chamber, as per cut No. 1, forming a right angle of the space ground out. All defects should be filled out with amalgam, and if a portion of the lingual wall has been destroyed, a screw pin may be inserted in the lingual canal and the filling anchored about it, rebuilding this portion of the tooth to be left standing. This leaves the lingual two-fifths of the tooth standing, the sides being ground down until the circumference of the entire tooth is greatest at the gum line. If sufficient grinding is done at this point a band may be fitted so the edge may not be encountered to any degree of disadvantage on the finished crown when the tooth is scaled. There is no necessity for extending any band beneath the gum to any extent. If the edges cannot be burnished easily without bruising the gum, then the band is too long and may always be a source of irritation. The buccal wall may be left a little above the gum until the band is fitted.

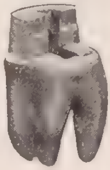

Fig. 1. The tooth prepared ready for the crown.

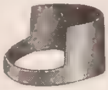

Fig. 2. A Band cut the shape of the prepared tooth.

Next, the pulp chamber is prepared by simply enlarging and making the walls parallel. The chamber may be squared if desired, which may add resisting power. If the depth is as much as two millimeters, it is sufficient to hold any crown with the lingual portion of the tooth standing.

THE BAND

As the crown is to be cast in order to bring out all the features of a well constructed crown, the band may be made of 36 gauge hard gold. Coin gold with five per cent. platinum rolled out to 36 gauge is very desirable. The band made and thoroughly burnished and extending a little higher than the highest portion of the prepared tooth is cut away on the buccal side and made to conform with the shape of the prepared tooth. The buccal edge of tooth and band may be beveled with stones as short as desired, the edge of band extending just a little higher to be soldered to a diaphragm.

THE DIAPHRAGM

The band is placed in the mouth, a diaphragm of 36 gauge, pure gold is annealed and burnished to conform to the buccal seat; up the wall of the lingual half and over the remaining occlusal surface; the band is removed and one edge neatly tacked with a very small amount of 22K solder, trim off surplus and return band and diaphragm to the tooth, finish burnishing, remove and complete soldering over a Bunsen burner, having all edges sealed fast, using a small amount of solder. Again return soldered band and diaphragm to the tooth, puncture the diaphragm and insert iridium-platinum dowel, being sure it is well seated. After waxing it to place, remove, invest and solder dowel to diaphragm. Return this cap and dowel to the tooth, obtain a bite and impression in the usual way.

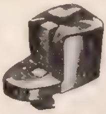

Fig. 3. The band-diaphragm and dowel; the dowel showing about two mm. below the band.

When mounted upon the articulator, the next step is the selection of a Steele's Interchangeable Facing, which affords strength, is easily ground to place, has artistic qualities, needs no gold tip when articulated properly; brings out a full porcelain effect at gum line, is not subjected to heat and may be replaced in case of fracture or to change the shade.

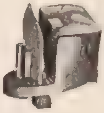

Fig. 4. Shows the facing ground to place and tacked with small amount of sticky wax

Fig. 4 shows cap, the dowel extending below and facing ground to place and tacked with sticky wax. The cap is fluxed with boracic acid and alcohol. Inlay wax is now used to finish waxing up the case, bringing out correct articulation with cusps and sulci, properly carved and wax covering the entire band, reproducing contour and contact point. Wax should extend around the buccal portion of the band, reinforcing the thin gold.

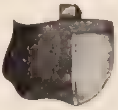

Fig. 5. Shows the crown all shaped with inlay wax ready for casting.

The case is now removed from the plaster, facing removed, casting and finishing procedure carried out in the usual way. The indirect method may be very uniquely applied in constructing this crown, the details of which I shall not take up in this paper.

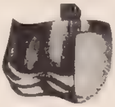

Fig. 6. The finished crown cast in gold.

A crown constructed in this manner will be found accurate in adaptation to the tooth, correct in articulation, outline and contour, possessing abundance of anchorage and strength, and the esthetic effect is very pleasing.

INLAYS, GOLD AND SYNTHETIC CEMENT RESTORATION*

BY S. F. JACOBI, D.D.S., EVANSVILLE, INDIANA

IF THE QUESTION SHOULD BE ASKED of the dentists of this country—What one thing in dentistry above all others has been of the most benefit to the public and to the profession in the last ten years?—the answer would be, "The discovery of the inlay."

When gold crowns first came into use, we thought we had indeed reached the maximum of skill in saving teeth; and we could then restore lost tooth structure that before seemed impossible. But we cannot stand still, we must progress; so one day the dental world was given the process of casting gold to a hidden model; and in my opinion we have arrived indeed at the place where ingenuity has reached her highest point, and are enabled to do our work with the satisfied conviction that it is not only a good method for restoring the lost portion of a tooth, but it is hygienic and very practicable from a mechanical standpoint.

In a large number of cases we no longer have to resort to the unhygienic method of crowning (I am referring of course to the gold or shell crown) which to my mind can be made the most unhygienic thing we can put in the mouth. Now we can cut away almost all of a tooth and restore it to its normal use with an inlay, and make such a perfectly hygienic restoration that for me it has made work a pleasure; for I feel that if my technic has been correct, I have performed an operation that will allow me to meet the patient months afterward without the thought—Is that filling still in place, and is it giving good service? Don't misunderstand me; we have failures in this just as in all other kinds of work.

I only wish to emphasize the fact that the inlay makes it possible to make restorations that are most practical from a mechanical standpoint, being better tooth savers than any form of gold filling, and the most hygienic, because the proper technic always demands that the cavity must be extended into solid substance, and all frail edges must be eliminated.

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*Read before the Indiana State Dental Society, 1915.

In other words, the theory of extension for prevention must be carried out, and in my opinion this is the accepted method of cavity preparation at this time. With the inlay we are saving more teeth with less fatigue to the operator, and certainly the patient appreciates the cutting down of time in the chair, to say nothing of the absence of the malleting of gold foil, and the use of the rubber dam.

The technic of cavity preparation is uniform throughout this country. Doctor Conzett says: "The fundamental principle of good inlay work is proper cavity formation. The gingival seat has no great retentive or resistance function, but is the foundation base of the filling, and should be perfectly flat to prevent any tendency to movement in any direction. The axial walls should be as nearly parallel as it is possible to make them. They are made with an inlay bur, one that is dentatious is a favorite with me, to be followed with one of the same kind without the cross-cut. After the cavity is practically prepared, it is smoothed up with sharp chisels, hoes and stones. The cavity is now finished with the exception of the cavo-surface margin. This is to be bevelled all around. It cannot be too strongly emphasized that the bevel that will protect the enamel rods is the only preparation that is rational in the treatment of a tooth for the reception of a filling or an inlay, so that you can burnish this part of your inlay, which often assists very materially in closing a joint that is otherwise a perfect fit."

I had intended to say something of porcelain inlays, but having had so many failures in this kind of work I have practically discarded the use of them, excepting in cavities where all conditions are most favorable, such as position, ease of access, matching of color, etc. The class of cavities that have presented us with the most difficult problem for their restoration are those found in the proximal surfaces of the incisors and the bicuspids. It is not that these cavities are more difficult to prepare than those in other teeth, but no matter if we maintain that the prime object is to restore lost tooth structure and stop decay, we must consider that modern civilization, with the growing esthetic tastes of our people, demands that we do not display our dental operations to the eyes of the world. All evidences of our operations should be hidden as much as possible.

In contour restorations, where the incisal angle is gone, oxyphosphate cements and synthetic cements have not been satisfactory; but I am happy to say that in my hands the gold inlay, with an insert of synthetic cement in that portion of the gold inlay that can be seen labially, has for me solved a most perplexing question. That is, the restoration of the incisal angle with a material that is practical from a mechanical standpoint, and that at the same time will not offend the esthetic taste of the most fastidious patient.

Prepare the cavity as for a gold inlay, and before removing the wax from the cavity, a box-shaped cavity should be carved in the labial aspect of the wax model. This, of course, calls for great care and a steady hand.

Remove wax model from cavity, invest and cast. Before cementing the gold inlay to place see that the box-shaped cavity is properly prepared, note by fitting into tooth that you have a good strong tip on incisal edge, that it is properly beveled, also that the edge of box cavity in proximal space is well hidden from view, and will be covered with the synthetic cement when placed in cavity. Good undercuts must be made in the gold, for we know synthetic cement has not the sticky quality of the oxyphosphate cements. Now cement the gold inlay to place, and after cement has completely hardened, at same sitting, or preferably at another sitting, fill the box-cavity in gold inlay with synthetic cement. If great care is used in your technic and in the selection of your shade, you will have a restoration that will be very satisfactory. The wide range of colors given to us by the manufacturers makes it possible to get a shade that under moisture will defy detection. A method that has been advocated, and no doubt has its advantages, is to cut a window on lingual side of gold inlay before inserting the synthetic cement, thereby admitting light and taking advantage of the translucency of the synthetic cement; but experience has taught me to select a shade that under most circumstances is very satisfactory, and in my opinion the work is stronger, and can be better finished without the so-called window.

The essential thing in the successful handling of synthetic cements is to follow the directions of the manufacturer. My experience of this combination filling dates back three years, and so far I can report the most flattering results. It is the most artistic work we can do. You do not have a change of color after cementation, which is a thing you cannot say of the baked porcelain. Those of you who have had experience with baked porcelain inlays know how often you have had a perfectly matched filling before cementation, and after setting to place it has completely changed color. This has been my experience; no doubt my own fault, but I have seen but very few perfectly matched porcelain fillings of any one's making.

There is a great diversity of opinion in the use of gold inlay as abutments for bridge work. Personally, I use this form of abutment whenever it is practicable to do so. In my opinion, I can prepare a tooth for an inlay abutment with a great deal more certainty than I can for a gold crown. I do not believe anyone can prepare a tooth properly for a gold crown without first devitalizing that tooth; and when you have devitalized the tooth, what is the use of taking the time and trouble to further destroy the contour and occlusion for a gold crown?

No doubt I will be challenged in claiming that an inlay is preferable to a gold crown as an abutment for a bridge, and I do not want to convey the impression that I use this form of abutment exclusively. Each case has its own peculiar characteristics. For a tooth that is badly broken down and the occlusion entirely gone, a gold crown is most certainly indicated as an abutment, but it is the large, bell-shaped molar or bicuspid that I claim in my opinion must be devitalized, so as to enable you to strip it of its enamel; all occlusión must be destroyed; and should there be a tooth adjoining, all contact point must be destroyed, and all those essential points must be restored by the use of a gold crown. Now why go to this trouble, and I might say risk, of restoring these points when you can obviate this by cutting a straight cavity through the center of the occlusal surface, flaring lingually and buccally as you approach the mesial or distal surface as the case might be, so that your inlay is broad at this point, enabling you to get a strong solder attachment for the dummy next to the abutment?

Always insert a strong pin of clasp metal or iridio-platinum into one or more canals through the wax model before removing from cavity for casting. By this method you obviate the risk of building a crown with a well fitted band at gingival line, and the restoring of the contact point and the natural contour of the tooth.

The well-merited rebuke American dentistry received from the eminent English surgeon, Doctor Hunter, was no doubt prompted by our careless crowning of teeth. I honestly believe more bridges fail on account of badly fitted gold crown abutments, thereby causing infection, and final loosening and loss of the abutment, than from any other cause. So in my opinion it is far better to devitalize and do the work as it should be done. With our present knowledge of canal treatment and filling, I believe we are pretty safe in risking a pulpless tooth as an abutment, rather than to put a gold crown on a badly prepared tooth, inviting disaster and final loss of the work.

The wax impression is another very important part of inlay work. The proximal cavities in bicuspids and molars are to me the most difficult of any found in the mouth. I endeavor to secure a light separation before taking the impression, by packing the cavity with cotton and covering with temporary stopping. I pack the cotton well down to the margin of the cavity and cover with temporary stopping, allowing quite an excess of this material on occlusal surface so that in masticating the mass will be forced into the cavity, causing quite a separation, with little or no soreness. At next sitting I finish the cavity and take impression. I always use a matrix, one of the many varieties that are on the market, or I make one out of a thin copper strip as the case might indicate. I coat the side of matrix band next to cavity with cocoa-butter, as this assists very materially in securing a smooth polished surface on the proximal surface of the impression.

After a great deal of experimenting with the different kinds of wax on the market, I find I can secure the best results from the Taggart wax, brought to the proper consistency in hot water. After shaping with the thumb and fingers to approximate the shape of the cavity and holding in position in cavity with thumb pressure until hard, I carve the occlusal surface for proper articulation. Remove matrix band, wipe off the wax with oil of cajeput, remove from cavity with sharp instrument, or if possible, heat the sprue, insert into wax and remove impression. Use soap suds on camel's hair brush to remove all traces of saliva, etc., and you are ready for the investment. I do not wish to advertise anyone's materials, but I cannot refrain from acknowledging my gratitude to Doctor Taggart for sending out an agent, whose mission is to instruct us through all the steps of inlay work, from heating of the wax to the finished inlay. I can certainly say that I have had fewer failures since using this method and can honestly commend it to all.

There seems to be quite a diversity of opinion as to the kind of gold to be used in casting inlays. Some use 24-k., others 22-k., and others any old kind of scrap they may have on hand. Personally, I use 24-k. in all cavities excepting those in occlusal surfaces. In these I use 22-k.; also use 22-k. for all inlays used as abutments for bridges.

I have in a rambling sort of way given a few hints on inlay work, on any one of which volumes could be written, but time does not permit. My object is to appeal to you for more attention to detail. For instance, my statement in regard to devitalizing a tooth before attempting to prepare it for the reception of a gold crown. You must cut away that tooth sufficiently to be able to put on a close-fitting band at the gingival margin, and you must cut away the cusps enough to enable you to replace them with good thick gold cusps, sufficient to bear mastication and restore the lost occlusion. The contour must be restored for future protection of the gingiva. If you *will* crown instead of using an inlay as an abutment for a bridge, do it well, not half way. I claim that in a great majority of cases we can let the exterior of these fine molars and bicuspids alone and not deface them simply because it is so much easier to make a bridge with a gold crown abutment than with an inlay abutment. So it is in cavity preparation, on which I have touched so briefly; the many little points of detail which taken all together make up the successful result, is the nature of my appeal. Do the best you can for the case in hand, whether it be crown or inlay, and the reward and satisfaction of work well done will be yours.

DISCUSSION

DR. D. A. HOUSE, Indianapolis: Recognizing the importance of the subject of this paper, and the capable manner in which it has been presented, I feel that this society is to be congratulated in having Doctor Jacobi on its program. The subject as presented is concise, to the point and easily understood, and while I agree with the essayist generally I must take exceptions decisively, at least as to myself, to one part in particular.

It is true that with the advent of the cast gold inlay our nerve-racking labor has been lessened, as well as the long, tiresome, dreadful ordeal for the patient. I believe it is true that more teeth are being saved for a longer time with the gold inlay than were with the gold filling, not because I believe the inlay method better than the filling method, but rather because the conditions existing around and especially under the inlay are conducive to better preservation of tooth structure than with the filling. The decay all removed and cavity properly prepared, as long as the cement is all there and protected, the gold inlay will save the tooth, but don't lose sight of that cervical margin.

I think well of gold inlays. They are great. But I have yet to see the evidence to convince me that there will be as many in service after twenty-five, thirty, forty, even fifty years, as there are of the gold fillings put in by some of our older practitioners of today and those whose names are honored in the dental profession. I have seen many perfect gold fillings, having served their purpose three, four and five decades. Have you seen many gold inlays you were willing to be sponsor for, for that length of time? I have not.

The "gold inlay synthetic cement restoration" is good. The technic, of course, is important, and is plainly given by the essayist. It's good. I can add but one point which experience has taught me, and that is, whenever possible use an iridio-platinum pin at the incisal step, and I often use them at the gingival seat of the cavity. I find such a pin threaded, the inlay cast to it and cemented in the cavity, adds greatly in preventing a movement of the inlay in the only direction it can possibly move.

The technic for the synthetic part of the inlay is good. My worst trouble has been to get, or rather, retain, the color used. I have had to change several cases by inserting new synthetic fillings.

I have never tried the window on the lingual side, although have known of the idea for some time. I don't believe there is enough advantage in its use to warrant the possible trouble it may cause. The window being between you and darkness, the transmission of light is practically nothing. To illustrate: A porcelain inlay cemented in position is often off color. Place your mirror in the mouth behind it and by the transmission of reflected light your inlay is shown in good color with the tooth. I have inserted a number of gold-synthetic inlays and I like the results.

The use of inlays for supporting bridges I consider good practice, but unless the inlays are quite deep seated or have a large iridio-platinum post, or both, I consider it dangerous to unite both abutments to the bridge, because the movability existing in each individual tooth will loosen one or the other of ordinary seated inlays.

My method has been to attach the bridge to the largest and strongest inlay, supporting the other end of the bridge by a strong iridio-platinum bar or wire resting in or on the other inlay. In this way we retain a flexibility to the bridge necessary to allow the movement of each individual tooth, at the same time we retain sufficient strength to the bridge for purposes desired.

I wish to commend the essayist on his appreciation of this technic and materials of Doctor Taggart. Since the Taggart method and materials were demonstrated to me I believe I can safely say that my inlay troubles have decreased about ninety per cent. It seems to me a clinic showing the technic of this method and the use of the materials would be worth while.

While I have agreed generally with the essayist, and can endorse his appeal for minute detail, for it is the little things that count in dental operations, I now wish to state my one exception in particular, and that is the thoughtless, ruthless destruction of the dental pulp. It seems so unnecessary, so uncalled for. I will admit that for esthetic reasons we may be justified in some cases, but that only in teeth that are plainly visible.

Take a molar for example. It's a perfect molar, fine, so-called bell-shape; perhaps a half inch from gingiva to the point of the cusps. In order to help support a bridge its pulp must be removed, because the essayist and many others say it is impossible to grind the tooth and fit a crown band properly unless the pulp is removed; and I will agree with them, and further add I do not believe they, myself or anyone else can fit one crown band in twenty properly after that fine tooth has given up its pulp.

To illustrate: How many of you would think of giving a clinic, showing the crowning of a molar as described, and would call it perfect unless the edges of the band not only fitted the cervix of the tooth, but presented a smooth, continuous surface with it? You would be careful to have your models show exactness and symmetry for fear of criticism. Can you reproduce that same exactness on a tooth in the mouth? If you think so, after the bridge is in place, with an explorer examine the circumference of your band and see if there is no place where cement is not capable of remaining, where mucus, food debris and other irritating causes can exist. If you can do so, and can show a case, and the method, send for me; I want to see it.

I am sure you do the best you can. We all do or should. There are cases where we must crown. We must try to fit the tooth around the gingiva, but not a tooth as described above or many similar teeth. Such teeth must be crowned at times, but keep the band away from the gingiva, and keep away good and plenty. Neither get the idea that very many pulps are going to die in teeth crowned that way.

That is not the only reason for my protest against such practice. I will wager that twenty per cent. of this audience who have one or more devitalized teeth will tell you that at some time they have discomfort with a dead tooth. Why, then, create the possibility of such a condition when there is no necessity for it? We must and always will have to remove pulps of teeth. I know that. With all the modern forms of anesthesia and appliances at hand it is not at all difficult to take the life of an unsuspecting pulp. If only that were all that constitutes the operation!

I believe in minute detail. I believe in the most careful technic. I believe in progress; not being perfect we can't stand still, but I want to go on record as believing also in pulp-conservation and pulp-preservation and bitterly opposed to ruthless pulp-annihilation.

I enjoyed the paper very much, as there are many good things in it, and I congratulate the essayist on his clearness and sincerity in presenting the subject.

THE PRESIDENT: We have with us a distinguished dentist from one of our southern states, Doctor Tileston, of Louisville, and I will ask him to review and discuss this paper.

DR. H. B. TILESTON, Louisville, Ky.: It always gives me pleasure to address this society. There are only two points I wish to refer to on this very interesting subject. One is concerning the reference made to the lack of adaptation at the gingival margin in cast inlays, that bugbear which has prevented us from getting perfect gold inlays, the difficulty of getting them perfectly adapted at the gingival. I know no reason why an inlay should not be made to fit as well at the gingival as anywhere else. Is there anything peculiar about the gingival portion of an inlay that should make it impossible to succeed there as well as anywhere else? There are two reasons why we fail to get adaptation at that part. One is we do not get our wax to the gingival. When you get your wax there properly, your gold will reach that point too, all right, if you cast it correctly. The other reason is we do not cast correctly, and hence fail to get good filling of our matrix at the gingival. If you have a cavity whose depth is greater from the occlusal to the gingival than it is from the margin of the proximal surface across the occlusal to the mesial or distal, you will find more difficulty in getting your wax down in that deep portion towards the gingival than anywhere else. If you take a pellet of wax and attempt to force it into the cavity and make it reach the gingival, you probably will fail. For that reason, after forcing the wax as far as I can by slow gradual pressure, getting it as far as it will go, I lift it right out again. Now if you look at the margin as you have prepared it, or that gingival wall, and then look at your wax, one glance will show you that you haven't gotten the wax into contact with it. Now fuse some wax on that portion of the inlay and reinsert it, so as to use the more or less chilled wax as a plunger, and force the softer wax up there, so that when you take it out, it has not only reached that margin, but has overlapped it; then you know you have your wax to that point and you have a good impression of that wall. In forcing the gold into the matrix in the casting process, let the force be so directed, by the manner in which you invest the model, that the gold is thrown toward that wall and not away from it. Very often the wax is lifted from the cavity and a sprue attached on the proximal surface, so that the force in casting is toward the occlusal, and in that case you get good adaptation at the occlusal; but make the attachment of the sprue right over the gingival wall on the occlusal surface so that when the casting is made the molten gold goes right toward the gingival, and outside of the little slips that occur in casting, if everything has gone correctly, your gold will reach the occlusal and your inlay will reach to your gingival wall. There is no reason why we shouldn't fit that wall as well as any other. We don't fit any walls perfectly; if we did, there wouldn't be any room for the cement. There is a certain amount of difficulty in the fitting of gold, a hard, rigid substance, to another hard, rigid substance like the tooth. But there is no reason why it shouldn't be just as nearly perfect at the gingival as anywhere else.

I want to endorse the stand taken by Doctor House about the preservation of the pulp. It is so easy to destroy the pulp. If we were only certain that that ended the difficulties, I would say, kill all the pulps, for I do not believe they are of such importance to the mature tooth that we should preserve them for the tooth's sake. But it is because of what follows, the consequences in teeth with dead pulps. If we could be certain to eradicate every fragment of the pulp, and replace it with some non-destructible, non-infectious material, we would be all right. But we are facing a serious problem in dentistry today. The X-ray shows all our mistakes in a way that threatens the safety of the dental profession. The medical profession is taking X-rays of the jaws of their patients, and they see these little areas of pus secretion at root termini called blind abscesses, that we know nothing about as far as our vision and the knowledge of the patient goes, areas of infection which are supposed to be threatening the general health of individuals. A lady in my office a short time ago said, "A friend of mine had to have, by the direction of her physician, three teeth extracted because of an abscess in her knee." Possibly this is going a little too far. It may be that the danger of systemic infection is so remote that it is not quite as serious as it appears now. I think both the medical and dental professions will tone down after a while to a more sane view of these things, but there is an idea that systemic involvement arises from the roots of teeth, and they are always pulpless teeth; they don't come from vital teeth, but they are pulpless teeth, where the pulp has died *in situ* or has been removed and the pulp cavities have not been properly filled. If we know we can so fill a root that we can be certain of no danger of septic effect from fragments of pulp left or parts unfilled, then remove all of the pulps. But if there is any doubt of it, then make an effort to save that important part, not for the sake of the tooth, but for the sake of the systemic conditions that might arise from an imperfectly treated and filled root canal. We should hesitate before we condemn uncompromisingly every effort to preserve a pulp because we can perform a more perfect mechanical operation if the pulp is out of the way. Let us try to bend our mechanics to the necessity of preserving the pulp, and do something, in all cases where it is possible, which will not involve the removing of the pulp.

Dr. A. R. Rietz, Evansville: Doctor Jacobi's subject having been covered so well I feel there is very little left for discussion. But knowing the writer as I do, I am sure he would not feel satisfied if I didn't raise a few points.

The first point of difference to which I wish to call your attention is the inlay *vs.* the shell crown for bridges. It is true that shell crowns can be made a very unsanitary piece of work, which is also true of an inlay. We have all seen gold crowns that have been in the mouth for many years and giving good service and satisfaction in every way.

According to the essayist he always devitalizes a tooth for inlay abutment and inserts one or more posts in canals. If I had a bridge in my own mouth I would prefer having the tooth crowned rather than having it devitalized to have a post inlay used as an abutment.

In my opinion the chances we take in devitalizing a sound tooth are too great: the number and shape of the roots, curve at the apex, danger of breaking off a broach far up in the root and not getting it out, improper root filling and various other things may cause the loss of the tooth. In case it were the last tooth to put a bridge on, I would feel guilty of a great injustice to the patient.

Personally, I would rather risk the tooth with a live pulp and a crown for the abutment. In case the pulp dies then we can treat the tooth. When in school over thirteen years ago I was taught to devitalize all teeth for crowns, but my experience has taught me that we are taking more chances on a dead tooth than on a live one.

There are many teeth that we can prepare and make a perfect fitting crown without devitalizing; for instance, take a lower molar: in most cases you can make a perfect fitting crown. It is not necessary to extend the band below the gums. Fit it at its largest circumference. My contentions are that a live tooth is better than a dead one.

Dr. R. R. Gillis, Hammond: With reference to the window made in the back side of the inlay, I have found that a help in restoring the color. The essayist sounds a note of warning, in that sometimes you may weaken your metal inlay. This is especially true where you do not have a great amount of space from your cavity margin to your contact margin, or where the proximal restoration is not great. We must remember that the object of the metal inlay is simply to hold the porcelain or synthetic facing, and for that reason we must leave a good substantial incisal portion of metal. It isn't advisable to cut away a great amount there if you are going to use 24-K metal for casting; a lower karat is preferable because of greater rigidity. I have found that it helps if, at the last fitting of the inlay previous to setting, I fill the box portion with temporary stopping. Then, after pressing the inlay into place with the cement behind it, I have less difficulty to pick or scrape out that temporary stopping than to get out the cement after it has hardened.

On the point of restoring contact, there are very few approximal inlays in my practice now where I do not use an addition of solder to make an absolutely tight, even-crowded contact point. It is much easier, in shaping the wax, to slip a thin ribbon saw through the approximal space (where you do not use a matrix), draw it in a little, and you wil adapt the wax to the gingival and the inlay will remove easily. Add a little solder at the contact point on the cast inlay and you have restored that in good shape.

The first discusser brought up the point of the lasting qualities of the inlay as compared with the gold filling. I do not believe we are justified at this time in drawing conclusions on this point. The inlay has been in service less than ten years. It isn't fair to the inlay to compare it with the gold filling whose history extends over several decades.

A subsequent discusser mentioned the technic in restoring the gingival adaptation. One thing which I learned a few months back has been of great value. In the burning out of the wax, it was the practice to burn it out under great heat, getting perhaps the whole investment almost red hot before casting. If, instead of that, you put it over a slow fire, drying the investment thoroughly and heating it only to the point of melting your wax out into the body of the investment, then with an almost cool investment (having it so you can handle it in your fingers) put it in the machine, fuse your metal in the crucible, and use your force to drive it into the mold, you will find a more perfect adaptation than if you heat it to a high heat. This method cannot be used with vacuum machines, but only with those apparati where you use compressed air or gas or some other force than the air pressure.

Dr. F. R. Wilder, Louisville: Doctor Hinman, of Atlanta, makes his inlays by the indirect method, and I believe it is a good idea, because you can burnish that gold and grind it toward the margins of the cavity, and get a more perfect inlay, and if you should destroy one, you still have the model to work on. Some claim it can be done quicker than in the ordinary way. That doesn't appear to me to be so, but Doctor Hinman claims it is so, and I am inclined to defer to his judgment.

In regard to destroying healthy pulps in teeth for abutments, I believe where you find it is going to be a practical thing, where you want a good strong abutment, and that it is really necessary to destroy that nerve and remove it, you should do so and place pins where they will hold good and strong. Doctor House mentioned placing pin or lug on the bridge leaning on the anterior tooth (cusp of the tooth). That gives that tooth in mastication a chance to work a little bit, and doesn't loosen the inlay. I have also found that in soldering it will draw the gold inlay out of place unless you have posts in it. There is oftentimes a little crevice that it is impossible to fill unless you cut the inlay from that bridge and resolder it. I oftentimes have to do that where I have two gold inlay abutments for a bridge.

An inlay of any kind, in the majority of men's hands, is better than with the old method of gold filling. In the ordinary gold filling it is usually pretty poor work. I know I can do much better with the gold inlay; can put better fillings in difficult positions, anterior and posterior surfaces of the teeth, and where it is almost impossible to place gold fillings, no matter how careful you are. The exhausting effect on the patient with such operations is bad. These two points, making inlays by the indirect method and the destruction of those nerves where you want to get anchorage for your bridge, I believe are practical points.

Never use gold crowns unless a tooth has been so absolutely destroyed that you cannot place anything else; a gold crown is only indicated in that special instance; or, if you wish to cut a tooth only half way down the tooth and put half crown on there, this is also a good idea, and will make a strong operation. But to try to place gold crowns on teeth down to the gingival margin surrounding the entire tooth is a difficult operation. This half-way crown is very practical, and I am glad Doctor House and Doctor Tileston brought it up.

I enjoyed the essay very much and want to compliment the essayist, Doctor Jacobi. It covered the field thoroughly, and was very much to my own liking.

Dr. F. R. Henshaw, Indianapolis: We have been teaching in the Indiana Dental College the technic of construction of gold inlays and of porcelain inlays. I believe we have been doing it well, and have been much pleased with the teaching this year. I have arrived at the conclusion that the proper and perfect construction of gold inlays is a matter of so very grave and serious concern to the dental profession that we have arranged for next year a special chair in this school, under the charge of a man who, I think, has no superior as an inlay worker; and I feel sure we can promise you that the Indiana Dental College will have a course in gold inlay work next year that will be equalled by none in the United States. I believe I can safely say that our course in this work this year is as good as that to be found anywhere; next year we are going to lay special stress on the technic, on the particular care that the gold inlay is entitled to.

It doesn't matter to me, if I am faced with the necessity for the devitalization of a pulp, if in my candid judgment I am going to give to my patient a greater solidity, a greater degree of service from that operation, because I am well aware, as of course we all are, that there are a great many possibilities of defective work in the way of root canal filling. Every man who fills a root canal has a serious undertaking before him, and yet if the question of the efficiency of a certain given piece of work is involved, and it demands that the pulp in that particular tooth be destroyed, I personally have no compunction in its destruction. We, of course, would preserve those teeth with the greatest degree of comfort and safety to the patient, if it is necessary to destroy the pulp.

I do not want you to understand that I believe in the ruthless destruction of pulps under every conceivable condition. I would put it the other way—where it is possible for me to make the restoration that I believe is called for in any given case, and preserve that pulp, I always do so. If my judgment demands of me that I destroy the pulp, I do not have very many heartburnings about it. I do the root-canal work to the best of my ability, and I think I spend more time on that than on anything else I do. It takes a lot of time and calls for the greatest attention, and I believe I am giving my patients the sort of thing they need. I am giving greater strength and lasting properties to the thing I am doing.

We must not consider the gold inlay as an evanescent thing, here today and gone tomorrow. We have had things of that type in dentistry, but that cannot be applied to the gold inlay. The application of the gold inlay is so wide, so various, so extensive that we have only dipped into the perfect and proper technic; we are only just beginning to arrive at it. That is the reason why next year, we are going to lay more stress than ever on the technic of making gold inlays, and I believe you will see the effect of it in the students we turn out next year.

Dr. Harry C. Carr, Indianapolis: I believe the dentists throughout the country are faddists of the deepest dye. A few years ago when crown and bridge work was developed, every one was making crowns and bridges on vital teeth. We found we had such miserably fitting crowns that some one suggested the devitalization of the tooth to be crowned. Then everybody swung toward that side. Today somebody has suggested that devitalization is a bad practice, and here we go in the other direction. Dentists need a balance-wheel; and let us do the thing that is indicated, not because some one else says it is a good thing, but because we know the case demands it. Today the inlay seems to be taking the minds of the dentists, and we are discarding everything else now for the gold inlay. I do not think the gold inlay is indicated in every place, and especially in the anterior teeth, unless perhaps an incisal edge happens to be missing; and in the proximal surfaces, never. I cannot see why an inlay should be put in the anterior surfaces of bicuspids in all cases. We waste good tooth structure, and why not use the old standby, tin and gold? Put in a portion of that filling with tin, and finish it with gold. You do your operation at one sitting, without much distress to the patient, it is done in a short time, you get a good result, and you save a great deal of tooth structure, which means assistance to those more or less weak teeth.

The gingival margin has been emphasized as being the weak point in the gold inlay. I think in many cases we speak of the man making the inlay as an expert, but we are not all experts in making gold inlays. It is the average dentist we must take into consideration, and he is not always capable of making an inlay that fits perfectly at the gingival margin. It doesn't make so much difference at other places, but it should fit at the gingiva. I think a good plan is to use a layer of tin foil at that point. Tin foil is soft and compressible; you can place the tin foil on the inlay after it is fitted and ready to set, stick it on with a little collodion varnish that comes with the cement and set your inlay after introducing the cement into cavity. You will have a perfect joint of tin at the very margin, where it is most liable to decay, and we know that tin is a metal that preserves tooth structure. The inlay is something we should all exercise a little judgment on, and use some of the older and more tried things in places where they are indicated.

Doctor Jacobi (closing): The discussion shows that everyone has his way of doing things. There have been some very good points brought out. I want to pay Doctor House a compliment, and that is, he has no superior anywhere as an operator, and if we could all make gold crowns as he does, results would be different. There is scarcely a day in our practice when we do not find bridges put on with gold crown abutments, with a gaping space at the gingiva, full of debris and infection of all kinds, and the first thing you know the tooth is wobbly, and out it comes. If we will put on gold crowns, let us do it right. The trouble is we want to put on our gold crowns down to the margin and under the edge of the gum, and if we don't cut that tooth down properly, we won't get it there properly, and we have a bad margin, and invite infection. So, I believe, and still maintain, that it is better to devitalize so as to be sure you can trim the tooth properly than to take the risk of not doing so. You cannot devitalize a pulp without observing aseptic measures. The man who doesn't do this is as criminal as the man who opens an abdomen without being aseptic. I read a splendid article by Dr. Hinman; he speaks of devitalizing with cocain and sometimes having so much soreness after using the cocain. He said it was because we were dirty; we didn't use the aseptic measures we should use, and we crowded some of the infected matter through the pulp and out through the apex of the tooth, and then we have soreness. We must be aseptic.

The points brought out by the other gentlemen are good, and I wish to thank them. Doctor Rietz spoke about being afraid to fill the roots of a tooth. I want to tell a secret here. In our town we have a pretty live crowd. Three of us own an X-ray machine. We never fill a root canal without examining it first, and after it is filled we examine it again. If Doctor Rietz is real good, we will let him in on it.

THE CARE OF THE DECIDUOUS TEETH.*

BY I. W. COPELAND, D.D.S., ASHLAND, OHIO.

WE HAVE FOR OUR CONSIDERATION this evening one of the most important, if not *the* most important, branches of our duties to humanity which we assume when we pledge our lives to the good of the human race; a branch which has been slighted more than any other subject by writers and essayists, and I sincerely hope that this meeting tonight may be the opening wedge in starting a state-wide campaign for the better education of the profession on the subject that all of us have to admit that we have neglected.

It has a very intimate bearing on the building up of a successful and lucrative practice, for early impressions are indelibly fixed in a child's mind; and a practitioner who successfully brings a child through the trying period of the first dentition is very apt to keep that patient as a permanent advertisement throughout his period of practice.

I am going to endeavor to touch on the different phases of the care of children's teeth more in an endeavor to bring out a good rousing discussion than to try to teach anything new and startling, though, if I could convince myself that there was anything that I had picked up in my two decades of practice, you surely would be welcome to it, for as we toil through the years of servitude to the public we come to realize more and more how much of a duty it is to one another in the dental profession to impart everything that might advance the cause.

The first thing that we can do to help the first dentition in cases under our care, is the treatment of the mother during pregnancy.

It is a rather delicate subject to approach, but can be handled sometimes by instructing the husband and often by advising the expectant mother. It is strange that physicians almost universally neglect this instruction which has such an important bearing on the future welfare of mother and child. It is well in advising any treatment to suggest the consultation with the family physician to avoid any friction, for the medical men are very sensitive to any encroachments on their domain.

By the administration of a teaspoonful of Wyeth's syrup of phosphates, compound, or chemical food, as it is called, after each meal, to be taken during the last four months (or even longer) of pregnancy, and for at least four or five months after the child's birth, the mother can be saved a great amount of trouble with her own teeth and the dentition of the child will be very greatly benefited, as this preparation supplies the very elements that are needed and the scarcity of which often results in a fatal drain on the supply that the mother needs and an insufficient supply for the child.

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*Read before the Richland-Ashland Dental Society.

There is no surer way to secure the gratitude of a patient than to advise them on this matter. After endearing ourselves to the family they are very apt to come to us for advice during the eruption of the deciduous teeth and then is when we want to be ready with some sympathetic advice.

It is rarely necessary to lance the gums to assist some refractory "eye" or "stomach" teeth, as they persist in calling the cuspids. Thorough massage by the nurse or mother with borax water, listerine, Hands' Teething Lotion, or even a silver spoon, usually produces the desired result, and much harm may come from the indiscriminate cutting of the gums.

We should advise the mother as to the care of the temporary teeth from the first appearance of the lower centrals; a saturated solution of borax or boracic acid on a clean soft cloth will keep them in good condition if it is used after nursing, though there are a great many families who do not think they are doing their duty unless they can use some medicine with a distinctive taste. For them it is well to prescribe a very dilute solution of listerine, or some of the milder liquid antiseptics—used in the same manner.

After the child has begun to walk and talk, a brush should be advised and powdered orris root or other non-irritating dentifrice prescribed, to be used after any food is taken and the last thing before putting to bed.

One of the hardest things we have to overcome is the ignorance of parents on the necessity of care of the baby teeth, though, thanks to the splendid work of the National Mouth Hygiene Association, that is being largely overcome.

Approach them first from the humanitarian side, the duty they owe to protect the child from the awful suffering that so many have to undergo. Teach them that the irritability of the nervous system which decayed and abscessed teeth produce often seriously impairs the child's mental efficiency and has been known to produce idiocy. Tell them the benefit a sound set of temporary teeth has on digestion and development.

Describe how the permanent teeth can be injured by coming in beside the decayed temporary ones and the vast amount of foul matter and germs that are absorbed and swallowed all the time. The germ proposition always gets them to thinking; then describe to them the necessity of the temporary teeth to cause the proper development of the jaw, to avoid the crowding of the permanent set. Show an illustration of the position of the unerupted permanent teeth, if possible, to fix in their minds the necessity of growth to make room for the second teeth.

The first impressions that we make on a child have a great bearing on the success that we have in doing the slight operations that are usually necessary.

Never try to deceive them in any way, for their minds are particularly receptive and if their confidence is once lost, it is very hard to do anything for them afterwards, even after they reach the age when they can usually be reasoned with.

If a child is afraid of the operating room and chair, it is well to let it sit on its mother's lap and merely make the most superficial examination the first time, and perhaps in some very nervous cases, to have the mother make several calls with the child before attempting any operations. Have some little story to tell or something to amuse it, and in a short time you will have impressed the fact on its mind that you are not dangerous and the time that you spend in acquiring its confidence will be repaid many times over in the ease with which you can handle the child in the future.

Of course there are cases where a certain amount of Spartan firmness is the only thing that will suffice, but those cases are very rare and nearly all will yield to persuasion in a short time, and will give you much less trouble afterwards.

Perhaps you may think that I have dwelt at unnecessary length on this subject, but I have frequently seen men attempt to approach children in a manner that would have ruined the disposition of a hound pup.

Above all things, keep cool and don't allow yourself to become excited, and also endeavor to keep the parent from getting the child uneasy. That is frequently a harder task than handling the child.

The first approach of caries can usually be successfully stopped by the application of nitrate of silver, after first protecting the mouth from its escharotic effects.

The easiest manner of application is to heat a fine piece of platinum wire at one end and pick up a small crystal which can be dipped in water and applied to the surface of the previously partially dried cavity. Let it remain in contact with the surface of the cavity as long as there is no danger of the saliva flooding over, wipe it off with cotton and let the child rinse its mouth with water which has already been placed in readiness.

This treatment thoroughly applied will frequently be all that ever is necessary to do to that particular spot, especially is it so in the case of the approximal cavities in the anterior teeth and gingival cavities in the molars. If the nitrate does get on the gum slightly it does no particular harm, though it is well to tell the parents that it will cause a slight sloughing but will leave a healthy surface underneath.

Some parents will object to the color, for where it is successfully applied it will turn the surface black as night, merely the exposed dentin, however, but explain to them that if the decay can be positively stopped it is better than any filling that can be inserted for the good of the tooth.

The deeper cavities that would permit the lodgment of food particles must be filled with some of the materials that are non-irritating and easy to insert.

Copper amalgam does fine work in occlusal cavities while the approximal are usually best filled with oxyphosphate cement after first treating the deep portions with silver nitrate. This renders the cavity almost immune to further decay in case the cement washes out before the tooth loosens.

Of course, the approximal fillings will last much better if they are of amalgam, but it is difficult to get sufficient retentive form to the greater number of them and there is more danger of causing destruction of the pulps, for it is surprising the small amount of excavation that will uncover the pulp in the proximal cavities in temporary molars.

Copper cements have proven rather disappointing in our hands, though there have been a very large number of teeth saved with them. They do not seem to last as well as the zinc cements and sometimes cause a great deal of irritation to the pulp. With the preliminary treatment of nitrate of silver, the decay is just as effectually stopped.

In a great many cases, it is impossible to remove all the carious dentin without considerable pain and that is to be avoided if such a thing is possible, for we should do our best not to cause the little patients to fear us. It is usually necessary to remove only the superficial decay, dry the surface as well as conditions permit and after treating with the nitrate, you can be fairly sure that decay will not recur under the filling that you insert.

Occasionally, in spite of the utmost care, a pulp will be exposed and we are confronted with an extremely distressing condition and one that taxes our skill to the utmost to avoid causing a good deal of suffering.

In these cases, we have good results in many cases from gently placing a small amount of paste, made from equal parts of tannic acid and zinc oxide, mixed with a drop of oil of cassia, on the exposed pulp, and patting it over the exposure with a pellet of cotton, and then filling the cavity with very soft oxyphosphate or possibly one of the temporary cements which can be flowed over the pulp in a liquid consistency and later partially cut out and replaced by one of the more lasting cements.

The cases of exposure where there has been considerable pain are usually nicely controlled by carefully removing the decayed dentin and getting an opening into the pulp chamber, for there is almost always a small quantity of pus. After washing out the cavity with hydrogen dioxide, a dressing of oil of cloves in the cavity to be changed by the parents at frequent intervals, will keep the pulp quiescent and a few thorough treatments with carbolic acid will put it out of the way. The chamber can then be filled with a paste of tannic acid and oxide of zinc, mixed with a drop of carbolic acid and a cement filling placed in the cavity.

We have to take into account the absorption of the roots and endeavor to put some non-irritating substance in the pulp chamber which will keep the remains of the pulp in the roots in a partially mummified condition for the short time that the tooth is retained.

The tri-cresol formalin preparation sometimes causes severe irritation in the temporary teeth and has been discarded by the writer in these cases.

Abscessed conditions are very troublesome but can be quieted by getting drainage through the gum and tooth if possible, and instructing the parents to keep the tooth thoroughly cleaned out for a short time.

A dressing of oil of cloves sealed in the pulp chamber for a few days, followed by the filling of the chamber with the oil of cassia, tannic acid and zinc oxide paste and closing up with oxyphosphate brings them through in most cases.

Some of the chronic cases are rendered harmless by trimming down all the crown with a medium small bur to a point where food cannot lodge, and treating the root ends with nitrate of silver and leaving them to their destruction. (And in a large number of cases we are glad to arrive at that point.)

It is seldom wise to extract the deciduous teeth before they are loosened by nature, as the proper development of the maxilla at that point is always interfered with, and we should go to seeming extremes to save the teeth until the proper time for their replacement. The mere root of one of the temporary molars which has been rendered harmless with silver nitrate will assist wonderfully in the normal development.

Of course, there are cases where it seems imperative to extract an offending temporary molar, and right there is where it is well to call in the assistance of the dear old family physician and have him administer an anesthetic, in that way getting the blame in the child's mind for the whole performance, for of all the operations that we are called on to perform, can any of you name anything worse than the extraction of a temporary molar, before the roots are absorbed, for some frail, little child?

A great assistance in the extraction of the loosened teeth is a pair of elevators that I have with me this evening. With them, about anything in the line of whole crowns or broken down roots can be removed with the utmost ease. These elevators are the pattern of the Knott, with the handles somewhat shortened so that they may be concealed easily in the hand.

A fine acting local anesthetic in these cases is Black's mixture, composed of one part carbolic acid crystals, two parts of oil of cassia and three parts of oil of wintergreen. It works well, probably on account of the carbolic acid, and the children rather like the taste.

I wish to thank you all for your patience in listening to this feeble effort. I felt when your committee requested me to give it that there were many of you better qualified than myself, but I agreed to do the best I could merely to open the way for some of you to unbosom yourselves and let us know some of the good things that you keep locked up in your minds; for remember, however elementary and simple some things may seem to you, they may be just the things that the other fellow hasn't thought of, and I am sure that no member of this society need fear ridicule from any other if he advances any principle, method or even theory, for we are more of a happy family than the larger bodies and have no reason to be in any way timid toward one another.

THE BUSINESS SIDE OF DENTISTRY.*

BY W. A. MEIS, D.D.S., DUBUQUE, IOWA.

THE MOUTH being the most important organ of the body, it follows that as specialists of this organ our profession is of the greatest usefulness to mankind. This in itself should instil dignity and awaken in us a sense of responsibility. A certain amount of dignity and self-confidence should always be in evidence in respect of our profession.

In recent years there has been thrust a great responsibility into the hands of the dental profession, insofar that it is our office not only to combat dental diseases, but to prevent diseases as well; and that part of our work has culminated in that higher achievement of medical science, prophylaxis, or the prevention of disease.

Medicine is justly divided into two parts: *Prophylactic*, or the art of preserving health and prevention of disease; and *therapeutic*, or the art of restoring to health. The latter has been predominant up to a very recent period instead of its sister art, the prevention of disease, which should have been predominant all the time and gain the blessings of human kind.

When we consider that 90% of all disease germs enter the body through the mouth, and that from 75% to 90% of all children have defective mouth conditions, it is safe to assume that with the elimination of such deplorable mouth conditions in children, at least 50% of all diseases with which they are now afflicted would be wiped out and the death rate of children be lowered surprisingly. Therefore, the dental profession justly lays claim to this higher achievement of medicine, prophylaxis, and the beneficial results derived from its practice.

The value of men's services of today is measured by the benefits these services confer upon humanity, and in proportion as we in our professional capacity bring help and cheer to humanity will our calling be worthy of respect. And if we deliver our services conscientiously, we should not only be respected, but our remuneration should be commensurate with the benefits conferred.

Dentistry is a profession; and, as in all professions, the element of business enters into it, and to get the most pleasure, profit and success out of it we must study the rules of business and apply them.

Fame, prestige, popularity come to but few because of special gifts or the workings of genius, or by chance, or by "pull." The well-rounded success comes to the dentist only by hard work at the chair, at his text-books and clinics, and a thorough mastery and knowledge of the rules of the business game. Successful business and professional careers are not the result of chance, but are attained only by steady devotion to our task combined with the application of business principles and rules as invariable as the laws of physics.

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*Read before the Dubuque (Iowa) Dental Society, 1915.

Cost and selling price are two factors which should be taken into consideration in every business transaction by which anything of value changes hands. The cost of an operation in our profession is seldom thought of. The items that enter into the cost of services are the following: *Time, overhead expenses* and *materials.* To determine the cost we must average the expense against a prior number of operations performed, including the time consumed and materials used.

Following are the figures of the average dentist's overhead expenses per year, whether he is working all the time or not:

Office rent and heat	$350.00
Telephone	48.00
Light	20.00
Assistant	300.00
Magazines and reading matter	12.00
Printing and stationery	15.00
Society dues and attending dental meetings	55.00
Laundry	24.00
Taxes, insurance and equipment incidentals	150.00
	$973.00

To this we must add 7% of our investment in

College course	$2000.00	
Equipment	1500.00	
	$3500.00	
	.07	245.00

This added to overhead expenses makes a total of $1,218.00. This amount we must earn before we can figure one penny for material and our services. In a practice of $6,000.00 a year, cost of supplies (including gold and all precious metals), amounting to $928.00, places the grand total for cost of delivering services to our patients at $2,146.00. Deducting Sundays, holidays, vacation and time spent at dental meetings, we have about 280 working days left in which to produce the above expense, which accordingly amounts to $7.80 per day before we begin to receive any pay for ourselves, and then we must allow for dead-beats and charity work.

No dentist should work over eight hours a day. If we do, unless we have an extraordinary gift of vitality we are sure to break down under the constant strain long before we reach the age of three score years. Of these eight hours, every hour is not a productive hour with all of us.

We will take for an example an ordinary operation, that of making a gold crown. To prepare a tooth properly and complete a gold crown and set it in place will require about two and one-half hours, of which the total cost may be arrived at in the following manner:

Cost of gold used	$1.00
Incidental materials used	1.00
Overhead expense	1.00
Service fee $2.00 per hour, or	5.00
Total cost	$8.00

Unless a dentist is putting in a full eight hours every day, his net income at the end of the month will not amount to as much as a good plumber's or bricklayer's wages. They receive from $6.00 to $8.00 per day and have neither overhead expense nor investment. The average fee we receive for root canal treatment and filling has always seemed like a joke to me—when we stop to figure that usually three or four appointments (in treatment cases) and root filling are required; the fee of $1.50 to $2.00, allowing for overhead expense, will be less than a boilermaker receives for the same time consumed. It is ridiculous when we compare the fee with the importance of this operation and the influence it has on the general health of the body. It has been proven beyond doubt that many systemic diseases are a direct result of abscessed teeth and unsanitary mouth conditions. I want to ask each and every one of you to get a copy of the *Journal of the American Medical Association*, December, 5 1914, and read what some of the greatest men of the medical science have to say about mouth infection as a source of systemic diseases.* Such men as Thomas L. Gilmore, Chicago; Frank Billings, Chicago; C. H. Mayo, Rochester, Minn.; E. C. Rosenow, Chicago, and C. Burns Craig, of New York City.

I mention these men in order to impress upon you how much depends on the condition of the mouth, a fact which is being recognized by the medical world. I predict that it will be considered a legal offense in no distant future for a dentist to carelessly and negligently treat and fill root canals. *The insignificant fee is the cause of a lot of this careless and inferior work.* I think the X-ray will be the final solution for both fee and efficiency in root canal work.

Dr. C. H. Mayo said in conclusion of his paper: "The big stick which leads to our advancement is in the hands of the progressive and educated public, who are constantly demanding more of their dentists, of the medical profession and of the state in protecting them against preventable diseases." Now to increase our fees for this kind of operation we must impress our patients with the importance of the operation and the responsibility resting upon us. In fact, paint a mental picture of the good and bad results that might follow this kind of an operation, use such comparisons as putting a beautiful crown or an inlay on a poorly prepared root, the same as building a beautiful house on sand. And while the case is being treated explain each individual step to them and why it is taken.

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*These papers appeared in full in THE DENTAL SUMMARY, Jan., 1915.

It is no trick to get $12.00 and $15.00 for a cast-base Davis crown from the average patient if the operation is properly explained and its merits made clear. Let us learn to sell our services for a more adequate fee.

The meanest competitor of today is not the advertiser and quack. We find him rather in the ethical and honest dentist of old, who, though well meaning and of recognized ability, may be likened to the man who stood still and who is too unprogressive to sell his services at a price or fee based on correct and complete figures for cost. His figures are either mere guess work or are based on estimates of prices for material and expenses and general conditions existing in years gone by. Our fees have not advanced in proportion to the cost of living. I plead for a more intelligent selling price. Quit having compassion with patients' resources; they do not feel sorry for yours.

Dentists seldom grow rich on profits derived from dentistry alone. The estimate is that 70% of the dentists are in very moderate to poor circumstances, and only 10% of the public have their teeth taken care of. These percentages should be reversed. We give our health, our strength, our nerves, our vitality and enthusiasm and when that is gone our income stops. What's the selling price? It's up to us to name and the proper time to do so is while we are still able to render services.

The object of this paper is not to dictate to anyone as to fees he should charge for a given operation, but to bring up a general and thorough discussion of what it costs today to deliver our services. Let us not be competitors, competition becomes destructive beyond a certain point. Let us co-operate instead.

MODELLING COMPOUND—PLASTER IMPRESSION*

BY DR. T. D. DOW, STANTON, MICHIGAN

The following is a method employed by Doctor Hoff, using beeswax and plaster of Paris in combination for impressions. Fit the tray to the mouth, leaving 1/8" to 3/16" over the alveolar process. The parts of the impression that cover the hard parts of the palate are cut out, a very thin plaster is placed in the impression and immediately pressed to its place in the mouth. By this method we get compression of the soft parts of the mouth, and no bearing on the hard parts, very accurate definition, and it is not necessary to insert and remove the impression more than two or three times, which is of value with a nervous and more or less ignorant patient.

*Clinic Michigan State Dental Society, 1915.

PREVENTION AND REPRODUCTION*

BY DR. WILLIAM CONRAD, ST. LOUIS, MISSOURI

THAT "HIGH-FALUTIN" CHILLICOTHE DENTIST of whom I am very proud, Dr. Charles Mills, put me in as a substitute, for Dr. W. H. Whitslar of Cleveland, who is prevented from being with you by serious illness, and I am very glad he did. If I should fall down this afternoon, I hope you will forgive me, because this is the first attempt I have made at a paper for several years.

The paper is entitled, "Prevention and Reproduction," clinical experiences. If we can answer all of the following questions in the affirmative, the practice of preventive and restorative dentistry will be very much simplified, and a great blessing conferred upon mankind:

First: Does enamel have sufficient vital force (or life) within itself to reproduce or attempt to reproduce or repair a part of itself, lost by disease or otherwise?

Second: Does the alveolar process reproduce or attempt to reproduce or repair a part of itself, lost by disease or otherwise?

Third: Does the cementum reproduce or attempt to reproduce or repair a part of itself, lost by disease or otherwise?

Fourth: Does the gum tissue reproduce or attempt to reproduce or repair a part of itself, lost by disease or otherwise?

I might add, *Fifth*, dentin, etc.; *Sixth*, pulp, etc.; *Seventh*, peridental membrane, using the same phraseology as the above. These last have been answered in the affirmative for so many years that I will leave them out of consideration in this paper.

I hope to help some of you now to realize the importance of these questions, for should the true answer to all of them prove to be the affirmative, immunity and susceptibility to dental caries becomes an easy matter for us to control, and the treatment of many other conditions would become most positive.

I must answer my questions before you can have an idea where I stand. *I say "yes" to all of them!* Our practical dentists and many research men say the so-called dead and gone dental tissues are dead and gone forever, while some of our research men are changing to the belief that life is infinite, and needs only a proper stimulation to start the life spark to functionate again.

We should never, knowingly, destroy tooth tissue, but try to give it, in all cases, a chance for its life. I am sorry to say some dentists never do this, but the first thing they do is to stick a bur into any and all areas of decay, regardless of what preventive dentistry has proven, never trying by treatment to reduce the areas of decay to the minimum, and to establish a reasonable line of demarcation between the healthy and diseased tooth tissues. This leads me to believe that a large percentage of fillings are never necessary. I know that many of you will find this hard to believe, but it is true nevertheless.

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*Read before the Rehwinkel Dental Society, Chillicothe, O., 1915.

Preventive and reproductive methods give the diseased tooth a fair chance for life; then why not consider the patient's equity in the fair chance to the same? If prevention and restoration is the certainty I regard it to be, it puts in the hands of every dentist a most colossal power for good, by a safe and sane, prompt and never-failing method of practice, which leaves all teeth immune, by banishing the susceptibility to dental caries to the oblivion of a dead and forgotten past, driving from the mind the old-time theory of "inherited" dental caries or susceptibility to the same, also ending all the terrible suffering attending such conditions.

Preventive methods never fail, when half an effort is put forth by the dentist and patient. I have been following this line of practice for a great many years, and am more satisfied today with the results than ever before.

Enamel and other dental tissues need only proper stimulation, and a strict regard to hygiene and sanitation, to revive the apparently dead tissue to a renewal of the life spark, which is never dead, to a renewed activity, in its effort toward reproduction. Whether it is a renewal of the tissue itself, or a so-called secondary effort, or something equally as good, I cannot say. Just as long as the disease disappears and the organs return to a live, healthy condition, that is all I ask.

My methods are to grind, polish, scrape and treat.

I grind to reduce the areas of decay, sharp edges, angles, fractures and elongated teeth, deposits on roots, etc.

I polish to harden the surfaces and to stimulate the reproduction of new tissues.

Scrape, to remove diseased tissue and deposits on teeth and roots, for without a positive and complete removal of all foreign deposits, all treatment must fail.

And by treatment in this instance, I mean medication. It is most imperatively demanded, if we hope to get favorable results. These results should be of such a wonderful character as to keep us keyed up to the top notch of enthusiastic expectancy, by the miracles made manifest in every day of my practice.

It is positive, safe and sane, and never fails those who believe in their work. The preparations I most frequently use in my practice are:

Ten per cent. sol. silver nitrate; biflourid of ammonia (tartasol); zinc chloride; carbolic acid; sulphuric acid; emetin; local anesthetics, etc.

Ten per cent. silver nitrate. Why 10% instead of any other per cent. up to full strength? Because after using from 1% up to full strength solution, I find a 10% solution is the strongest solution I can freely use myself, and give to my patients for home use, without running any risk of cauterizing the tissues of the mouth. I require this home treatment, as so much depends upon it. In my practice, everybody gets it, as its potency for good is so much greater than any other drug I use.

Decay cannot start, and when present, it cannot progress. Its action on the mucous membrane is a most wonderful antiseptic and sedative. Normal, healthy teeth will never stain from the use of silver nitrate, if applied once a day forever, and for diagnostic purposes, its value is without limit. (See Stebbins and others.) Doctor Stebbins has a valuable paper in the *International Dental Journal* for 1891. I have patients use it once a day for a week on teeth, and gums, and then polish off the stains; repeating this treatment for as long as necessary. Brains, conscience and judgment help me to know how long to continue the treatment.

Bifluorid of ammonia is another remedy I use a great deal. Its use increases with my knowledge of its remedial value. All cases of pyorrhea, with denuded roots and loss of process, whether secreting pus or not, indicate its use. It stops the formation of pus, opens up the pockets, so you can see to remove the deposits, and enables one to dress and polish absorbed apical areas of denuded roots. Chronic abscess with fistula, extensive loss of process, roots and apex denuded and covered with deposits may be treated by packing with tartasol and cotton, and you can easily remove dead tissue and deposits, and the stimulation caused by tartasol, will create new tissue, secondary tissue, or something equally as good, to fill up the cavity left by lost dead tissue, or it will cause an attempt at reproduction or repair of a part lost by disease or otherwise, all of which was to have been demonstrated at the clinic.

Zinc chlorid is of great value in the treatment of erosion, whether tender or not. It eases painful conditions and hardens the tissue, and prepares it to resist the progress of the disease. I also use it to flood the cavity when I expect to fill with amalgam, working the amalgam into the zinc chlorid. I always use the saturated solution when it becomes a syrupy consistency.

Carbolic acid I use in so many conditions I will not attempt to enumerate them, but I request all of my patients to use a 2% solution brushed hard into the gums, three times a day. Mallinckrodt's Gold Label Carbolic Acid Crystals is the only brand that I use in all my work. It is pure and one of the few white carbolic acids.

Sulphuric acid I use diluted in calcified root canals and pyorrhea pockets.

If any of you wish to extend your point of view as to the live enamel tissue, look up Doctor Boedecker's scholarly article on the "Vital Matter in Enamel." This article does not agree as to totals, with the "dead enamel theory," which has been carried for so many years as an asset in copy-made text books, without any effort being made to establish the truth or area of the so-called scientific facts used as truth. Also look up an article by Doctor Fletcher on the "Reproduction of Cementum."

He tells how it reproduces itself, or attempts to reproduce or repair a part of itself, lost by disease or otherwise. It does not matter whether the roots are left smooth or in grooves.

Anyone making intelligent observations in every-day practice, can see evidence where the alveolar process and gum tissue show a restoration or an attempt at restoration or repair; in some cases so complete that the beautiful gum festoon, so admired by us all, is restored to its normal condition even when the roots are denuded of tissue, half way to the apex or more.

This can be done by any of us. It is simply a case of stimulation and treatment, which will restore to activity the vital force, which is always present and never dies. The wonderful activity of this life force has been demonstrated again and again by medical experimenters.

My main point is that enamel and other dental tissues have sufficient vitality to reproduce or attempt to reproduce a part of themselves supposed to be dead and beyond repair.

There is no question about it to me. What becomes of the sharp spines or irregular ends appearing on the edges of newly erupted upper and lower incisors? Sometimes they are of little consequence; at other times they extend into a fissure through the entire enamel to the root.

I can hear you give me the same old answer: "They wear off." Not on your life! They never wear off. They fill up by a natural physiological process with enamel, which means to me that the enamel grows after the teeth are erupted.

When these spines do wear off, it is due to some pathological process. Watch a few cases and you will be convinced that my contention is true. (See Doctor Kennedy's "Fractured Lateral Incisor," which united and shows clearly where enamel or something equally as good had been thrown out, in an effort to repair the injury. It is a case of a fractured lateral incisor, where the crown was broken off entirely and reunited to the root, and threw off a deposit of enamel in its attempt to cover the fractured portion.)

Raper, in a paper on "Radiography," before the Missouri association, called attention to the help nature gives in those cases, where any effort has been made to remove the contents and fill root canals, as compared with those cases where no such attempt has been made. Most of us know that in a large percentage of cases, there is an effort of nature to close the apical foramen in pulpless root canals by encysting the same in a calcified capsule to exclude deleterious matter from entering these apical openings.

To show with what tenacity life attempts to remain in tooth tissues, let us take, for example, Younger's demonstration of implantation, of very old extracted teeth, and see how rapidly victorious life-giving force returns to them in all cases. The reason why they are finally lost is another story, not to be taken up at this time.

The oral foci of infection, so fashionable among your college professors today, is what we should expect when we can have oral and dental hygiene experts, crown and bridge experts, special pyorrhea experts, etc., who know it all, and knowing it all, leave such a train of dental wrecks behind, owing to carelessness, incompetence or ignorance.

In order to protect myself for using such violent language I will simply call your attention to the temerity of the present generation of dentists to begin to prepare themselves as experts before they get out of college. They have the literature prepared, appealing to a few dentists, to all the medical profession they can reach, and state that their practice is limited to "so and so." It is a violation of the professional spirit for a novice to appear as a specialist and flood the community with such literature.

The oral foci of infection very seldom follows good, perfect dentistry. (See an article by Schurmann, "Foci of Infection." See University of Illinois circular on "Foci of Infection," by Morehead.) Extremes in practice are dangerous to the dentist and patient, unless the dentist makes good his claim. Some patients find you out early in the game.

You must have confidence in yourself to do things. If you have this backed by real knowledge, others will soon see you as you see yourself.

I wish to call attention to a lecture given by Doctor Pippin last Tuesday morning before the Washington University Dental College, of St. Louis, on "Preventive Dentistry." He is one of our best dentists and that man has lectured me for my opinions as much as any other man; but he has fallen into the hole of preventive dentistry and pulled the hole in after him, and he never can see daylight until he comes out the other end.

DISCUSSION

Dr. W. W. Curtis: Doctor Conrad, in talking before the meeting began, seemed to think that I am disposed to throw hooks into him. It is not my inclination to do this, because I would be immediately classed with that sort of people who lack experience. However, there are some things I want to say. I believe that the ideas he has advanced in his paper are very pertinent, and that they will be the keynote of the future. It will draw the attention of scientific men for some time to come.

One of the things he mentioned is the reproductive feature of teeth, but we must consider their cause and origin. It is a foregone conclusion, which every dentist knows, that dentin can be reproduced. The enamel grows from within, and after the enamel has ceased its function of reproduction, and the tissue has become developed, its function ceases. Anything that may be produced after that must be a sort of tissue that will cover up such cracks or holes which may afterwards be formed.

It is not reproduction simply, and the filling in of a foreign matter. Scientists say that silver nitrate is self-limiting, and after it has been applied, it will only go a certain distance.

The life of enamel will depend entirely upon its constituents, whether or not it has completely ceased its function.

We all agree that there is life in the enamel tissue to keep it in its normal condition. The inner prismatic substance is organic matter. There must be some growth, because orifices inside are closed up. If these sections could be examined, we would see an entirely different substance. Doctor Register says, in an article in the *Cosmos* for December, that this substance "is indissoluble, and caused by the silver nitrate."

The dental organic tissues are destroyed after their functions are complete, and while dentin might be dead, it gets its life again after death.

Doctor Conrad says he polishes to reproduce new tissues. I wonder if the life is not the life of the retention of debris, rather than from the growth?

If he did not polish the teeth, other germs would be deposited. Is it a case of reproduction or of keeping clean? If you break the glazed surface of the enamel you get into the prismatic substance. When the enamel has ceased its function, there is no glaze formed, is there? If that is so, how can it form this glaze? It is simply a case of some other substance. Is it reproduction or the growth of cicatricial tissue?

He makes reference to dental spines. We were taught that the number must be the same in each tooth. If they were placed haphazard, you might have five or six, and ordinarily there are only three. You might have four or five and there are only three on a cuspid, from which the entire substance catches origin and starts. Now, that being true, when it has ceased its function, it decays, not according to the age of the tooth, but according to the type of the individual.

Some grooves may not be discernible to the naked eye. It is simply a matter of decay according to the type.

You might take my tooth, that of a nervous type, and you will find these grooves somewhat marked.

My understanding is not as inclusive as that of the distinguished doctor who has preceded me, and I do not want to transgress against the ethics of the profession, but I am of the opinion that while there is growth of reparative tissue, it is not reproductive tissue.

You can graft a tree, but the graft is not the same substance as the rest of the tree. It is the same way with a bone or anything else; it is simply a reparative process. If it is reproduction, it must be identically the same as the original.

However, I wish to say that I believe if such articles as Doctor Conrad's were brought before the profession frequently, there would be more things explained and traced to their origin.

Doctor Conrad also said there was no discoloration in the tooth. Why do not all people have the same color of hair? How about the treatment of hair? Is it all the same? I would not change the color of my hair for a fortune. How about the different types to which teeth belong? It is the same way with a tooth. He could not destroy the color of the tooth, which belongs to my individual type.

I am very much interested in the paper, and thank you for your kind attention, and for the consideration the doctor has shown by his present silence.

Dr. L. E. Custer: I have known this crank for more than twenty-five years, and his eccentric paper was just about what I expected; and when I say eccentric, I mean just what I say.

That part of a piece of machinery is the eccentric part which at its proper moment reaches out and will set another mechanism to work; and he is eccentric who, in his life work, goes a little further in one direction than anyone else.

The first thing I wish to say is that dentin does not reproduce. Fresh dentin may be produced, but dentin does not *reproduce*. It is the misuse of the word "reproduction." Slight irritation will cause the formation or the replacing by secondary dentin; but to reproduce means that it was lost at one time, and then you get it back again. But the gist of the whole paper was in regard to the tissue. We all know that there is a certain bit of life in the animal matter in the tooth, according to the analysis about 4% of animal matter; and of course the life-giving agency must work through this, and this brings me to the point concerning the interglobular space.

That part of the cavity which is most sensitive is under the enamel. Isn't there some reason for that? Why should this part be so much more sensitive? My theory is that it is through this extra amount directly under the enamel which shows a larger percentage of animal matter, and it is its function to support the enamel so far as possible.

I cannot see from what I know of the development of enamel how it can have no life in it as long as the pulp is alive; life sufficient to produce fresh enamel or to produce other enamel, not to reproduce it.

I cannot believe that, although I know that it does not harmonize with my early education along this line. The only development concerning this has been in the last thirty-five years. Enamel does possess some life, however small it may be.

Dr. E. C. Mills: I received notice about ten days ago that I was to discuss Doctor Conrad's paper, but I think my informant had forgotten the fact that I was an ex-officio member of the legislative committee, and during the past ten days I have been so taken up that it is almost midnight when I get to bed.

My attention was called to the *Dental Cosmos* of the December number, but I did not have an opportunity to read it, and the only points occurring to my mind have been from the paper that Doctor Conrad read.

I doubt very much whether Doctor Conrad would read this paper to any dental association in Missouri, because it is a tradition that the people of that state are more skeptical than in any other state.

A couple of weeks ago I was riding on the train, and I noticed a young man pass my seat who wore a U. of M. watch fob, and I asked him if he were not a Michigan man. He said yes, and I asked him to sit down. We had a pleasant conversation relative to the affairs of the University of Michigan. He said that he came from Hannibal, Missouri.

"I wish you would tell me," I said to him, "why it is they say 'I am from Missouri and you will have to show me'."

He said, "I cannot explain to you fully, but away back in ante-bellum times, and since then, Missouri people have been accustomed, if anybody comes there from the east, west, north or south, to think that they are trying to put something over on them, and are anxious to have it explained."

However, this skepticism is not confined to Missouri alone, but to many men in Ohio.

Doctor Conrad referred to a case of the reproduction of cementum, in a paper by Doctor Fletcher. That case is described in one of the magazines issued in 1911. Microscopic studies were made of it, and it was said to show the reproduction of cementum. Another case similar to it was furnished by Doctor Kennerly, of St. Louis. Another case is now in the hands of Doctor Conrad.

If nature is so strenuous and is doing so much to reproduce the dental tissues, why aren't such specimens in the mouths of people instead of in the collection of pathologists?

The recuperative power of dentin is made possible with but very few exceptions. Some of these cases might be expected where using an application of silver nitrate in incipient caries and might prevent further decay, but if the decay is deep, and you cauterize with nitrate of silver, there will be no appearance of decay, but in about six months your decay has made quite a deep progress towards the pulp in the dentin, and the only chance the dentin has to recuperate is after the portion has been removed and the tissues have been restored by methods of filling and protecting the dentin. This gives nature a chance for the dental tubules to furnish secondary dentin, and in that way to take care of itself; but it must be placed under conditions favorable to it.

In regard to the spines Doctor Conrad alludes to, he says they did not wear off. If that is so, why is it that no matter what material we use, or how hard it wears off, and often very rapidly?

As to the closing of the root caused by secondary dentin, those cases are always due to a condition.

If Doctor Conrad will please read the one or two issues of the *National Bulletin*, in regard to the latest scientific research as to matters pertaining to the apical foramen and causes of disturbances that have been undreamt of heretofore, he will change his views.

It is the life-force entirely that gives the tooth the animated appearance. The tooth and enamel are not entirely devoid of vitality. The dental tubules entering this laye of cells and the inner prismatic substance has 3% of organic matter, and all tissues tha have organic matter have life, unless where the tooth has lost its pulp and contains devitalized tissue. We say it is a vital tooth, but the only vital part is the covering of the root.

I think the paper stated that the pulp also has power to reproduce itself. Lymphatics have never been found in the pulp tissue. Where there are no lymphatics, we have no repair of any tissue.

DOCTOR CONRAD (closing): Now, gentlemen, you have worked me pretty hard today, for a convalescent invalid, but I have enjoyed it immensely, and I will not attempt to answer these questions from a histological standpoint, because all of my descriptions are drawn from clinical experience and observation, and I think that I can see and think about these things as well as most men.

I do not pretend to say what the change is that takes place in these various tissues, and I do not care what the change is, so long as the teeth are restored to a healthy condition. I am a practical dentist, and one who reads some scientific material, and tries to understand a little of it; but we know that the dental profession is a young profession, whose duties have been most closely confined to the practical side of the work, in order to make a living, and that it has only been within the last few years that some colleges and universities and medical associations have become sufficiently wealthy to take a few apprentices in hand and try to educate a few so that they will be reliable laboratory men. They have not served their apprenticeship yet. The only results that we get from research work up to date, with the exception possibly of Doctor Black, are uncertain. They have not learned how to use their tools, they cannot see by their imagination so very well; but I believe that the movement that has taken place in the dental profession in the last five years is going to lead to wonderful things for our benefit. It isn't the practical dentist in his every-day practice, but men like myself who think they see things without being intoxicated, who will do things. We have as much interest in the development of this side of our profession as the research man. He must get his suggestions from the practical man who thinks he sees certain wonderful changes taking place in the tissues, and it is his duty to develop this work and to tell men whether it is enamel, secondary enamel, or something equally as good, and if they agree often enough on the same thing, we will take it as a fact, but as long as they do not, we do not take it as a fact.

They have not sufficiently mastered the science, and we depend now almost exclusively upon men who have given up the practice of medicine and who have entered the laboratories, and after spending years and years in this study, they are just now getting some of the results of their application.

My hope for the future of the dental profession is for these research men to establish the facts and establish them upon a firm scientific basis, so that when we say a thing or hear a thing, it will be worth while. I do not claim to do anything or know anything. I know only that I know as much as the other fellow, because I can read what he says.

I do not know where this comes in, or who said it; I think it was the President who referred to the fact that in the future we would arrive at that state of perfection whereby we would all save our own teeth. I fully believe that we are arriving at that stage, and I am just as emphatically opposed to the extraction of teeth as a man can be. It has gone out of style in some neighborhoods to extract teeth.

I remember perfectly well when I was a tooth-extractor and gas-giver in the city of St. Louis. I did not know any better, and the profession referred those patients to me until finally I objected to obeying the orders of those who sent these cases to me, and when I reached that stage where I did not obey the orders, I had to go to my friends and tell them, "I cannot do it. I do not believe in it; I thank you for your kindness to me in the past, but I cannot do it any more."

Some one spoke about the stains on the teeth; I think probably it was my friend Doctor Curtis. I made the statement positively, today, that a normal tooth would never stain, and I repeat it, and it isn't necessary to polish them to get those teeth into a state whereby they will not stain. It takes only ordinary good care at home, but the reason we polish them is because it shortens the period of time in getting them into the normal state. If you use silver nitrate and ordinary home care, there will arrive a time when the stains are not there.

I do not believe for a moment that Doctor Mills ever saw a case whereby the process of decay had gone on, under a nitrate of silver treatment; and I make it so emphatic that he will begin to watch those cases to prove Conrad a liar and will fall in the hole himself.

I have discussed Doctor Bunting's paper on the "Suppuration of Dental Caries." He says there is a change takes place in the enamel of the tooth, which does correct the defect.

The paper has referred to Doctor Register's paper appearing in the December *Cosmos*—a most worthy paper, a paper well worthy of careful reading by everybody. It covers such a multitude of subjects and is so long, that most of the readers of that article I have spoken to said they merely got through a little bit of the history that he introduces, consisting of about three pages, and they thought it was all like that and they got tired.

I do not suppose there are fifteen men here today who have read that paper. One thing he says about this raw enamel, is that no matter what the tooth is filled with, if this dentin does not throw out its protection between the filling, there is a recurrence of decay, and in most cases of successful filling, this does take place. The dentin becomes healed and the filling preserves the tooth.

Our distinguished member, Doctor Mills, I believe, questions my statement that the average color of a tooth was all the same. I repeat it, and I ask you to try the nitrate of silver treatment, along with ordinary hygienic treatment at home, and watch the case and see what you will see.

My attention was called to the fact that the teeth become brighter and brighter in all cases, especially in children. The nitrate silver that I use makes the teeth whiter, brighter and harder and I use it in the treatment of children's teeth where they are gray, yellow, blue and greenish, most offensive in the mouth, especially of young girls; and I make their teeth whiter and whiter, and later when they resist the stains that come upon them, I get a creamy white color as the result in all cases. That is not a histological proposition, but a proposition that any dentist of an average practice can prove beyond the question of a doubt, in a reasonably short time.

I claim that teeth are all one color, and the mere fact that you can put the teeth in a state where they resist the nitrate of silver and the stains that come from the mouth itself, shows that if the nitrate of silver were good for nothing else, but for this use, it is worth its price.

Someone asked a question about the sensitive cavities; why they were so excessively sensitive. I cannot answer from a scientific standpoint, but I will change his query a little and say that the most sensitive cavities that you ever touched in your life were cavities in the enamel alone, and never reached the dentin. That is capable of proof if you will observe. When it reaches the dentin, it is done for, but why is it that in this dead enamel tissue we find those cavities that we cannot touch? You cannot explain it.

Copper Alloy Poisoning

Prof. Erich Harnack, the famous Jena pharmacist, announces the discovery of a new disease. It is a sort of chronic copper poisoning which may prove fatal. It is caused by bridge work on the teeth. Some of this work which was examined showed that only one-third was gold and the rest other metals, especially copper. This resulted in slow poisoning, nervous collapse and general decay. Professor Harnack warns people against this inferior alloy saying that it is even more dangerous than pure copper or zinc.—*Daily Press.*

In view of the above, wouldn't it be just as well to go a little slow in the use of copper alloys? It would be interesting to know if copper alloy fillings are open to the same suspicion.

CONDUCTIVE ANESTHESIA*

BY DR. GEORGE T. GREGG, PITTSBURGH, PA.

RELIEF OF PAIN has been one of the principal subjects of interest to the dental profession for the last few years. About one-half now is using some method and the other half is still talking about it. The great wonderment is, why do not all dentists adopt some method to relieve pain, and remove a great burden from their shoulders as well as their patients.

A few years ago it was found that only about ten per cent. of the population of this country took care of their teeth, and about fifty per cent. could afford to pay for proper attention. It was also stated that pain was the one reason for more people not looking after their teeth. A great portion of the profession, preaching constantly the importance of looking after the teeth, and with the knowledge that about half the population are afraid to come to them because they fear being tortured (and you cannot blame them) still will employ no method to relieve them from pain during operations.

There is a very small percentage of people who can have their teeth properly filled, pain included, and a good many years of observation have proven that the average dentist who does not use a pain-relieving method is greatly handicapped in doing first-class work. The wise and up-to-date clientage, nowadays, knows that there are dentists who fill teeth without pain. That clientage every dentist wants. He is not going to get them, and hold them long, if he has no way to keep them from suffering.

The up-to-date patient, when consulting a dentist the first time, now asks the question, "Doctor, do you fill teeth without hurting?" It is very embarrassing for you to say, "I don't believe in that." Now, there are a lot of dentists left who have to give that reply, and they certainly should be ashamed of it. It is this part of the profession that I once more want to enthuse toward the relief of pain. I do not believe there is a dentist who, if he thought he could excavate cavities painlessly, would not do so, and gladly. The trouble is, most men who have not taken up the work, fear it, because they think they are running a great risk, or are not capable of learning.

A great many expect too much—they are disappointed when, after a short trial, they have a failure, give up the idea, and say, "It can't be done." For those who are afraid (that is the word, for many have confessed to me) I will say that any man with ordinary intelligence, and a little bit of confidence, need not fear being unsuccessful in excavating sensitive cavities without pain, and I mean that absolutely.

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*Read before the Cleveland Dental Society, May 3, 1915.

Every day dentists are doing things in their practice that require more skill than the simple operation of banishing pain from their work. That is where the mystery comes in. Why don't they do it? Anesthetics seem to them intricacies to be greatly feared.

The poor fellow who has to tell his patients that he doesn't believe in pain-relieving methods should be pitied. He is missing a wonderful lot of opportunities to accomplish more than he ever dreamed of; his field of work will entirely change; he will be able to do more extensive pieces of work, and in very much less time than he ever did before. He will not shy at those cavities along the cervical margin, and send patients away with mouths filled with gutta percha, and incomplete. His burdens will diminish, his income increase. For every patient he relieves of pain during his work he will gain a "booster." It pays to have "boosters," not "knockers."

To the man who says you must have pain in order to do thorough work (a dentist once said, "Pain is the watchman in the tower to warn you that danger is near"), I will say he should not be practicing dentistry. What would he think of having his appendix removed without an anesthetic, so his yelps would guide the surgeon's hand in its proper course?

The day has almost passed when you can hand that sort of an argument to an intelligent clientage; they are beginning to learn differently. Banish pain from your practice and the major portion of your difficulties in dentistry end. There are two ways in which pain during dental operations can be successfully relieved—nitrous oxide and oxygen and local anesthesia by novocain. If I had to choose between the two methods, I would prefer novocain.

There is no painful operation in the mouth that cannot be painlessly performed under novocain anesthesia, conductive and infiltrative. It simply wipes pain off the dental map. Think of it.

I had the good fortune to have Dr. Guido Fischer instruct me in conductive and infiltrative anesthesia in my office last April. I wish I could express in words my gratefulness to him. He helped to remove a great load from my shoulders. When I said "Goodbye" to him, he told me to use novocain six months, then tell the profession what I thought of it. A year has passed and I am still using it (in that time I have used nitrous oxide and oxygen about fifteen times). Every day I am more enthusiastic.

Without novocain in my equipment, I would feel at a very great disadvantage. Here let me confess ignorance regarding the care and use of a hypodermic syringe previous to Doctor Fischer's visit with me. I feel fortunate when looking back over the years I have used a syringe and have escaped inflicting serious injury on some patient. I am sure that many sloughing gums after extracting have been due to ignorance of proper asepsis. Conductive anesthesia should not be tried by the careless, dirty dentist—strict attention should be paid to all details of asepsis.

I am not going to enter into the technic of the different injections. There are books published by Drs. Guido Fischer and Kurt Hermann Thoma that explain every detail, but I want to recommend that every man who contemplates the use of conductive and infiltrative anesthesia should get one of these books, study it, then get someone who is thoroughly familiar with the technic to instruct him on patients, and if possible, do the different injections himself, under the guidance of his instructor.

There are two points I might mention in connection with the technic—one is enzymol. Enzymol is a sterile, purified solution of the gastric juice, extracted directly from the peptic glands of the fresh stomach, especially designed for local application. I use it to cleanse the mouth of thick, stringy saliva, and if a small injection is to be made, the part to be operated on can be swabbed off with a piece of cotton dipped in the enzymol solution. It cleanses the part thoroughly, so when you apply your iodin and aconite solution, you are sure to have a sterile field.

Another point I wish to emphasize is, not to rub the gum tissue directly over your injection, because the iodin and aconite solution dries the part and you can very easily break the tissue and form a field for infection, and sometimes a pretty sore mouth. Instead of rubbing the gum directly over the point of insertion, place your finger on the outside of the lip and you will get the same results without any possibility of breaking the gum tissue. The lip will move back and forth without causing any friction.

I want to recommend novocain anesthesia to every dentist, if he wishes to lighten his burdens, increase his income and accomplish more in the practice of dentistry and for the good of humanity.

Westinghouse Bldg.

DISCUSSION

Dr. J. P. Henahan: It has been a great pleasure to hear Doctor Gregg read his most excellent paper. To Doctor Gregg I owe the favor of having given me the first practical instruction in novocain anesthesia. There is no one who could possibly have been a more Doubting Tom than I was before that demonstration and I could hardly believe that I actually was operating painlessly upon the first patient. But the anesthetic itself and the after conditions were so satisfactory, that ever since I have been trying to emulate the example of the master.

I agree with the doctor in his statement that the dental profession has shown great interest in the matter of anesthesia during the last few years. It is that interest which has helped in the development of the valuable and thoroughly efficient methods of anesthesia which the profession today enjoys.

Regarding the cause for so many men not practicing anesthesia of any kind, I might suggest the following reasons:

First, the natural fear which every man feels toward the administration of any anesthetic, general or local, and,

Second, the experience which the medical and dental professions have had with cocain, which with the lapse of time has grown to a fear not only of cocain, but of every other remedy not proven safe beyond doubt.

In novocain we have a local anesthetic for which its sponsors are all but ready to make that claim. The scientists who developed the remedy have the clinical records of thousands of cases experimented upon before the substance was presented to the profession. In some of these cases amounts of solution vast in the comparison with the greatest amount which could possibly be used in a dental case, were injected without dangerous symptoms developing.

The dangers which may follow the use of the solution are:

First: Psychic effects which may be manifested in slight condition of shock.

Second: Infection which may in all cases be traced either to lack of proper sterilization of solution, instruments, the operator's hands or the field of injection, or the introduction of the solution into an already infected area.

Third: The soreness or stiffness of the soft tissues or muscles due to faulty technic or the use of deteriorated tablets.

Fourth: The breaking of a needle and its loss in the tissues, all of which, with the possible exception of the first, may be avoided.

The dental profession is indeed to be congratulated upon its discovery of this valuable and simple method for producing anesthesia, for in addition to N_2O and O anesthesia and analgesia, we have methods now which will cover without exception any and all operations which a dentist may be called upon to perform.

It is to be hoped that those not already familiar with the reference books mentioned by Doctor Gregg will take note of them.

The term "conductive," as we all know, pertains to the function of the nerve trunk which is paralyzed by the injection of the solution into or around it, thereby preventing the passage of irritating nerve impulses to the brain.

This method is resorted to for the anesthetization of large areas and to allow for the performance of extensive operations. Anesthesia from a single injection may be produced which will last from one to two hours. It is also resorted to to avoid the injection into a local area in which an infection already exists.

Infiltration is what is known as submucous or subperiosteal anesthesia and produces anesthesia of the peripheral nerve endings.

The technic is to make the injection in such a position that the anesthetic solution is deposited so that the vessels passing through the nutrient foramina will take it up and carry it to the nerve filaments within the body of the bone.

Its advantages are that it requires the introduction of the minimum amount of solution. Anesthesia develops quickly, lasts but a short time and only causes anesthesia at the point where it is desired to operate.

Due to local anemia caused by the injection of this anesthetic, especially the adrenalin, which persists sometimes after the completion of surgical cases, it is necessary that the operator use good judgment in the care of wounds.

For lack of hemorrhage and resultant clot, the socket remains dry and open to infection unless carefully protected by packing for a short time.

DR. GEORGE N. WASSER: We are fortunate, indeed, to have for our essayist tonight one so well qualified in his subject as Doctor Gregg. He certainly has given us a strong argument to enlist in the entirely too small force that is endeavoring to relieve the horrors of the dental chair.

I cannot express in words my debt of gratitude to Doctor Gregg who aroused my enthusiasm about six years ago in the use of N_2O, by a paper read by him before the New York Odontological Society, and published in the *Items of Interest*. From that time up until last July I was quite happy and contented with the results obtained by the use of N_2O. I went about the country some, demonstrating and telling about its use in our work.

It was at the last meeting of the National Society at Rochester that I met Doctor Gregg in the convention hall, just prior to my going onto the platform to discuss a paper on N_2O. He told me in his quiet and convincing way of the results he was getting with novocain and suprarenin. I admit that it had the effect of a wet blanket on my discussion. I had the good fortune at that same meeting of seeing Doctors Blum, Thoma and Gillette's clinics on conductive and infiltrative anesthesia. I was much impressed with what I saw and heard and ordered an outfit at once, and read and studied Doctor Fischer's book on the subject.

Doctor Gregg was unselfish and kind enough to come up from Pittsburgh for a day last summer and give five or six of us Cleveland fellows a clinic in Doctor Henahan's office. It was an unqualified success. Doctor Gregg made the injections after which Doctor Henahan took out lower third molars and prepared cavities for fillings with not the slightest discomfort to the patients.

To be successful in the use of this method of anesthesia, four requirements are absolutely essential. They are a thorough knowledge of oral anatomy, exact technic, scrupulous asepsis and fresh drugs. It is the consensus of opinion that the toxicity of novocain is almost negligible, but that where we have toxic symptoms they are due to the suprarenin. My observation in several hundred cases bears out the truth of this opinion.

I have had just two cases of marked toxic effect, both followed after the use of the "E" tablets, which contain suprarenin 0.000,02 grams, with the "T" tablets, which contain 0.000,05 grams of suprarenin; no such effects have followed. These responded immediately to amyl nitrate in one case and aromatic spirits of ammonia in the other.

Dr. S. W. Allen: Anything which enables us to do our work better, more satisfactorily to ourselves and which also renders us capable of giving better service, satisfaction and comfort to our patients, is worthy of our most careful analysis and study. One of the means used to bring about these conditions and accomplish these ends is under discussion at this time, and since we are what we profess to be, a scientific body, it is our duty to become masters in our chosen work.

I would therefore divide the dental profession, ethical of course, into four grades or classes: The indifferent, the student, the adept, then the master.

Our subject this time relates to one of the fine and very effective means of avoiding discomfort to our patients. This is very necessarily of interest and great importance to each of us. But are we the only ones to be considered? By no means.

Our patients are as much interested as we are, if not more so. The great movement now of educating the public in regard to the relation of oral hygiene to the general health has also made this public less indifferent as to other things about the mouth, and they have become students as to the ways and means of caring for the oral organs when they have to be repaired. Especially do they inquire concerning the inconvenience and suffering their knowledge of previous work has made them think may accompany this repair. So we can easily see that their education concerning oral conditions has made them intelligent enough to appreciate it when their dentist uses the best known methods of contributing to their comfort while work is being done. This very fact automatically builds up a professional man's business in the best and most ethical way by having the best and most intelligent patrons satisfied, and bringing to you their friends also of the same class. At least you have an intelligent, educated and appreciative list of patrons. We have several means of contributing to the comfort of our patients and here the study of the indications and contradictions comes.

A local anesthetic is indicated in almost all dental and oral surgical cases.

These may be exceptions: hysterical patients or very excitable ones; patients who exhibit an idiosyncrasy against local anesthetics, not meaning that they have such when they say they do not want a certain kind of local anesthetic used, but when they show an unusual physiological reaction against the drugs used, and children whose co-operation is difficult to obtain; presence of infection in the area to be injected, as in conductive anesthesia in the mandibular area, where there is an abscessed third molar or a complete trismus of the muscles of mastication.

From this we know that in most cases conductive anesthesia can be used, but sometimes has its limitations, and an operator who gives up inhalation anesthesia altogether is either limiting his work to suitable cases or running a great risk in taking a chance with unsuitable cases. To perfectly master any method is to know how to use it, but especially when not to use it.

Advantages of conductive anesthesia over inhalation anesthesia and analgesia: no unpleasant after effects; effect lasts long enough for completion of most operations; hemorrhage more easily controlled; no cumbersome apparatus required; less assistance required; blocks off not only painful impulses but avoids traumatic shocks, which can only be avoided by nerve blocking or inhibiting the impulses along the nerve trunks.

The three causes of shock, I believe, are: *First*, anxiety of the patient, which is preoperative, and is a psychic disturbance which can be relieved by use of sedatives or hypnotics, as bromides or opiates. *second*, pain felt by the patient, which is relieved by general anesthetic and local anesthetic, *third*, traumatic shock, by cutting tissue which is not avoided by a general anesthetic, but is with number two, by using the conductive anesthesia. However, if time is the most essential thing and the operation will not last over 20 to 30 seconds, N_2O and O is very good, as it takes 10 to 20 minutes to induce conductive anesthesia. Comparing the conductive method with infiltration anesthesia:

INFILTRATION

1. Short duration.
2. Confined to an area.
3. Infected area can't be injected.
4. Frequent injections.

CONDUCTIVE

1. Lasts longer.
2. Extends through whole area of nerve supply.
3. Infected areas can be anesthetized except where there are abscessed third molars.
4. Fewer injections.
5. Extensive operations can be performed.
6. On account of anesthesia lasting so long, post-traumatic or operative pain is greatly reduced.
7. Less of the drug is required to be used.

What agent should be used?

Novocain is considered by many eminent men to be the best material for a local anesthetic. The most efficient local anesthetic is one which in solution has the proper isotonicity to the blood.

This is obtained by using physiological or normal salt solution (.6 to .90 %) and causes no pain when injected into the tissue, therefore having a proper exchange with the cells' contents it makes a good solvent or suspending medium.

Prof. Fischer advocates the use of the mixed chlorides for the making of a solvent for novocain, stating that the tissue takes up a mixture of Na. Ca. and K. chlorides more readily as they make a more isotonic solution to the plasma of the blood. This is called Ringer's Solution.

If solution is hypotonic, or less concentrated than blood plasma, cells take up H_2O, and swell up if solution is *hypertonic*, or more concentrated, the cells give up moisture and shrink. If solution is isotonic, an even absorption is obtained which is correct and brings about and adds to the comfort so necessary to the patient during these operations.

Each one can now belong to whichever class he or she chooses.

1. If we do not care whether we cause suffering, indifferent. 2. If we get literature and books on conductive anesthesia and other useful things in dentistry, by reading them we become students; by attending clinics and demonstrations, realize that knowledge is power, and these will make us useful.

3. If we become able to successfully apply this knowledge thus gained we become adepts at whatever we are doing.

4. If we do these right things in the right way we form a habit of so doing and become masters at our work, and are able to give far better work, service, satisfaction and comfort to our patients.

WANTED: BETTER DENTISTS*

BY FREDERIC R. HENSHAW, D.D.S., INDIANAPOLIS, INDIANA

BEGINNING WITH THE SESSION of 1917-18, all reputable dental colleges in this country will require a full four-years' course leading to the degree of Doctor of Dental Surgery. This was agreed upon by the National Association of Dental Faculties in their meeting in Ann Arbor, Michigan, in January, and by the Dental Faculties Association of American Universities in their meeting in Philadelphia, in February, and will probably be approved by the National Association this summer.

This action was taken in response to a growing demand from the public, the dental profession, and the allied profession of medicine, for better equipped and better trained dentists, a demand that could no longer be ignored.

When we consider that since the date of organization of the first dental college to the present time, only seventy-five years have elapsed, and that in that comparatively short time our profession has taken its place among the learned professions and has demanded and secured the respect of all other professions, we may well point with pride to what has been accomplished.

Yet we are just at the dawning of a new day.

The medical profession has undergone, within the past few years, a complete metamorphosis, during which the major part of the old-time theories and practices have been replaced by scientific and sane methods. The physician of today does not look with scorn upon the field of labor of the dentist, but eagerly calls him into consultation whenever the field of disease is within the oral cavity. Why is this? Because the modern physician is a trained scientific man, trained in pure and applied science and by virtue of this training he is aware that the dentist, because of his peculiar technical training and skill and because of the advancement in scientific knowledge which the past few years have given to his profession, is a fit coadjutor with him in all such problems as may have to do with this special field.

The friendly relation which has been established between the medical and dental professions is not likely to be broken, for there are too many good and definite reasons why they should be strengthened and extended.

The only danger that could threaten this relation would be the failure of either party to live up to its promise of progression. Just so long as each goes ahead with its rigid determination to progress along scientific lines, just that long will the inter-dependence continue.

And so we come to the matter of the need for better educated dentists. Let us concede, in the first instance, that the colleges have done all that they can to produce high-class dental graduates. It was a long step when the dental course was extended from two to three years, and even at that time there were those who decried this action and held that two years was long enough in which to train a dentist. However, it took only a few years to demonstrate that the student was kept busy over a course of three years, and as time went on, months were added to the length of term New requirements called for additions to the curriculum until at the present time no college course of any sort presents such a crowded schedule as that of the dental college. In many of the subjects the teaching is necessarily inadequate because of lack of time that may be given them. The greatest lack, and this is the one that we hope will be remedied by the addition of a year to the course, is in proper training in bacteriology, both general and special, as applied to affections of the human mouth, in oral surgery, in the diagnosis and treatments of lesions of the soft tissues of the mouth, in microscopy, in radiography and in economics.

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*Read before the Indiana State Dental Society, 1915.

We have come to the realization that adequate training along these lines is absolutely necessary for the dentist of tomorrow.

The dentist of today who does not avail himself of the opportunities afforded by association with his fellows is sure to drop into the rut of mediocrity which spells defeat for the possibilities that are within him.

When Hunter, of London, accused the entire dental profession of failure to meet the requirements of human needs and of their work being the cause of innumerable infections constantly recurring, a storm of protest arose from all quarters.

Then came Mayo, with the description of the effect of local foci of infection in various general affections, with the dictum that "the next great step in preventive medicine must come from the dentist," and with the challenge to the dental profession to meet it.

Doctor Best, of Minneapolis, has claimed and thinks he has proven by the radiograph that nearly 80% of all root canal fillings are defective, and while there are those who would disagree with him in some of his readings, for the radiograph is not infallible and cannot always be trusted as a means of diagnosis, yet we are forced to the conclusion that the percentage against us is lamentably high and that there is genuine need for careful consideration of this important subject.

Performance of dental operations has always been attended with such a great degree of pain that the dental chair has been looked upon with horror by every one so unfortunate as to need our services.

Modern methods have been so carefully and scientifically worked out for the elimination of the pain of dental operations that it is no longer excusable for the dentist to hurt his patient.

Indeed, in no other branch of surgery has such progress been made in this respect as in ours, and the use of conductive anesthesia, nitrous oxid and oxygen analgesia and anesthesia and the desensitization of cavities by direct application of the drug to them has put us in position to offer to our patients the possibilities of painless operations, better performed because of the absence of pain.

That scourge of the human race, pyorrhea alveolaris, bids fair to succumb to the scientific study and achievements of the dental profession and when we have conquered this malady we shall indeed be better dentists.

Permit me to quote from an excellent editorial in *Cosmos*, for May, 1915, by Dr. Edward C. Kirk:

> "It must be manifest to every one who has kept in touch with the progress of dental and medical thought that the problems which today call for solution as presented by the clientele of the average dentist are wholly different to those which confronted the profession less than a quarter of a century ago, and that they imperatively demand, in order to meet them, a correspondingly adapted type of dental practitioner. The immense possibilities which have been opened up, the recognition of the importance of mouth hygiene, the relation of oral infections to the bodily health, the nervous relations of defects in the dental mechanism, all present problems for solution which did not confront the earlier practitioners of dentistry, because the existence of such relations was then undreamed of; in consequence of which dentistry developed almost wholly as a mechanical art, and the system of education related to dentistry was until recently almost wholly technical and manipulative in its ideas."

I think this is the best statement of the case I ever have seen and while no sane man would desire for a moment to decrease technical or manipulative training of the dentist, it is equally apparent that his training, from a scientific standpoint, must be advanced if he is to occupy and hold the place to which he aspires. Only by the most thorough training and systematic development may we hope that our "place in the sun" will be attained and we will be most jealously watched to see that we deserve to retain it.

Within the recent months much has been said and written relative to the effects of local foci of infection in the production of many systemic affections and many of these have been traced to the mouth.

As in all new things, there has been a tendency of the pendulum to swing too far in the locating of these troubles in the mouth, and many physicians have been actual alarmists in their attempts to trace all sorts of things to this source, but the fact remains that many of these disorders do owe their origin to lesions at the apices of devitalized teeth,and it is up to the dentist of right now, not the dentist of the future, to see that this source of disturbance shall cease.

This means that we, who are now the dentists of the world, must be better dentists; that our treatment of root canals must be more careful and scientific; that our restorations must be more sanitary and that our methods when shown to be defective, must be discarded or revamped until they meet the conditions that we know now to exist; it means that we never get too old or too perfect to learn and by the learning to keep ourselves in step with the progress of the world; it means that only by taking advantage of the lessons of yesterday may the practice of tomorrow be perfected and strengthened.

Education means to lead out. What we hope is that the needs of the hour will lead out of us higher thoughts, better deeds and more careful consideration of the fact that our field of endeavor is upon living, breathing human flesh, which is entitled to all the advantage to be derived from conscientious, intelligent, thoughtful service. You and I can become better educated dentists just the same as we hope that the future generation may be. We have within us the power of going forward, of recognizing the needs of the hour, of living up to the precepts and example of the men who have done most to elevate our profession to a higher plane. We shall not be found wanting. We do not dare to be found wanting, for the eyes of the world are upon us.

We are expected to keep in tune with the universe, and to do so means to live up to our obligations and representations. Unless we keep the stride, we will be lost in the march of progress, so it behooves us to make of our own selves better dentists. By doing so we will aid the coming generations to reach nearer to the goal than we may ever get and thus our little part will have been played.

Surely we cannot be mistaken. All of the signs seem to point so definitely to the new era in which the dental profession is to come into its own, that the need to be worthy stands out as a shield, blazoned bright with the hope of all the fathers of the profession that their ideals may be realized. When better dentists are asked for in the future, may we all be able to qualify.

11 W. North St.

DISCUSSION

DR. H. C. SEXTON: In my opinion, Doctor Henshaw has given us a very thoughtful and commendable paper. The public does want better dentists and so does the dental profession. There can be no disagreement on that point. The only possible difference of opinion is concerning what means should be employed to obtain the badly needed better dentists.

There is no doubt in my mind that in the past the colleges have not been all they should have been. We all know that some of them have been very deficient in their courses of instruction. In other words, they have not given the student for his three years' work and expense all that the student was entitled to. The fact that we have badly educated dentists cannot be blamed altogether upon lack of time for their proper instruction, but it must, in part at least, be blamed upon poor methods of instruction and inadequate equipment in some of our dental colleges.

In order to show just what kind of material is sometimes turned out by the colleges I want to read to you some of the answers given to questions asked in the examinations by the State Board here in Indiana last year.

To a question about normal respiration, one man answers: "The normal respiration should be forty in a minute, which I counted right in here." That poor chap was evidently very much excited.

"The Eustachian Tube is a small flexible tube about six inches long located back of windpipe, connects the œsophagus and stomach."

"The Eustachian Tube is a large duct emptying into the mouth; it squirts saliva into he mouth."

"Ptyalin is a substance found in blood."

"A physiological salt solution is one which may be formed by or from the juices and acids of the body."

In reply to the question about the Eustachian Tube, one man very honestly writes: "Forgotten even an idea of this one."

"Physiology is the science that treats of diseases and their causes."

"The function of the Eustachian Tube is to take air into the lungs."

"The diaphragm is the bony framework consisting of ribs, sternum and vertebræ."

"Ptyalin is secreted by the pancreas and pancreatic juice."

"Chyme and chyle must be different names for some kind of enzymes, but I never heard of the names. Morrison never handed it out."

"The diaphragm is an oblong round cavity in the trunk of the body containing heart, lungs, stomach, liver, kidneys, spleen, pancreas, large and small intestines. In fact, all vital organs."

"The diaphragm is a cavity containing thoracic and abdominal viscera."

"Ptyalin is a substance which is made by the fermentation of carbohydrates. Its function is to render the peptones digestible."

"The diaphragm is the bony part of the body."

"The diaphragm is maid (sic) up of the ribs, and gives shape to body. Its most importain (sic) use in the protect (sic) hart (sic) lungs and other organs."

"The diaphragm is the framework of the body."

"A frenum is a little tit-like projection on the posterior part of the tongue, this is the principle one found in the mouth."

"The frenum linguæ are principle frena in the mouth, they are sort of openings or canals into the mouth."

"The function of the red blood cell is to promote infection and disease."

"The upper first molar (permanent) has four cusps and two roots."

"Blood plasma becomes lymph when it comes in contact with the air."

"The nerve which supplies the right upper central incisor is the submaxillary division of the fifth."

"A frenum is connective tissue connecting the vertebræ."

"The Antrum of Highmore is a small fossa or opening just below the second lower molar and usually perphiated (sic) by the roots of the molar."

"The inferior maxillary is a very large bone containing sixteen prominent teeth if in normal occlude (sic). It forms the hard palate. It has no motion in mastication."

I could quote you answers like that almost indefinitely, but what's the use? You have had enough. There may have been one or two of these men who were not college men but men who had the privilege of re-examinations because they were applicants under the old law, but the others are all college men, some of them juniors who had passed their examinations on these subjects before the college examiners, the others men who had been graduated and given diplomas.

Now I ask you: Were those men given full value for the time and money the college had taken from them? Undoubtedly not. The college instructors retort that they cannot put brains into a head made empty by nature. And that also is true. They cannot make students and they cannot make dentists of men unfitted by nature to be students and dentists. But here comes the rub the unfair rub: They pass these men, defective as they are, giving them certificates of competence when they are not competent. Is it honest?

It is just here that the good of a State Examining Board comes in. If all the colleges were ideally competent and ideally honest in their treatment of the profession and the student, then there would be no need of State Examining Boards, which are nothing more than police supervisors of the colleges.

And it is not only in their courses of instruction that the dental colleges have been very much at fault, but also in their preliminary requirements for entrance. Our law, Section 14, leaves the State Board the arbiter of the minimum requirements of a college in order to have its diplomas recognized. Indiana along with most states requires a diploma from a high school or its equivalent as a preliminary to entrance to a dental college. This rule the colleges have not enforced. At every examination the Board has before it applicants unable to use correct English. To say that these young men have the equivalent of a high school education is a joke. Some of them have not even the common school education of a boy in the sixth grade. The one for instance I have quoted above who mispelled such common words as "important," "made" and "heart." In education he was only twelve years old, and he knew no more of anatomy than a hog does of heaven; yet he had obtained entrance to a dental college and had passed his examination in anatomy. In the future such travesties must be made impossible.

In regard to the four-year course that Doctor Henshaw has told us about, I believe it will be a good thing. I believe that as a result we, the dentists, will become better dentists. It cannot help but influence us all. But we will expect more of the dental colleges than we have expected of them in the past. They must realize it and prepare for it. And I believe they do realize it and that the better colleges are doing all they can in preparation for it. The ones that do not come up to the new standards will in time lose entirely out. And that will be a good thing. Unquestionably we have too many dental colleges. Fewer ones and better ones should be the watchword.

In order that these preceding remarks may not be misapprehended and applied in quarters where they would work an injustice, I want to say that as an educator the friend whom we have lost during the past year, Dr. George Edwin Hunt, deserves nothing but praise. He had a high ideal for the institution of which he was the head and he spared no effort to attain that ideal. I fear we did not properly appreciate him when we had him. But it is always so in this d—— world. "We never miss the water till the well runs dry." As to Doctor Hunt's ability as an educator, this is not just a personal opinion of mine. It is that and more. I can prove it to you by statistics:

During the years 1910 to 1914, there were examined before the different state examining boards of this country 7,488 graduates of dental colleges. Of this number 1,226 (or 16.3%) failed to pass. The institution of which our Doctor Hunt was at the head had during those years 207 graduates examined before the various boards of the country, of whom only 18 (or 8.6%) failed to pass. In other words, in every hundred graduates turned out in America, 16 were flunked by state examiners; but of every hundred turned out by Doctor Hunt, only 8 flunked. So you see that when I say that as a dental educator Doctor Hunt stood high, as high as any in this country, and that means in the whole world, I am not expressing just my personal opinion. I am telling you of something proved, proved beyond doubt by cold figures, figures obtained from the annual report of the National Association of Dental Examiners.

One dental college during those years had a percentage of failure of 100. It graduated two men, both of whom failed before state boards. Such a college is a joke; nay, it is worse than a joke; it is a crime, a crime against the young man from whom it steals—yes, that's the word—steals both time and money. Some colleges of very high reputation have their graduates fail before state boards to the extent of 30 or 40 per cent. Of Dr. George Edwin Hunt, with his failure of graduates of only 8 per cent., Indiana and this state association, and the Indiana Dental College have just reason to be proud. He has left a monument behind him greater than any that can be raised of stone or brass.

There is another phase of this matter of education that deserves our earnest attention. In the colleges they are educating the dentists of the future. What about the dentists of the present? What are we doing for our own education? Are we so perfect that we can sit back and take no note of the progress of the times? Indeed no. Every dentist should be, every dentist must be, a student if he would make of himself a credit to his profession. He must be a reader and a buyer of books. He must have a library. The time is past when the only equipment a dental office needed in the way of books was a "Practice of Dentistry," dated 1880.

In the last few years a number of epoch-making books have appeared on dental subjects. Are they in your library? If not, they should be. If not, then you are not doing either yourself or your patients justice. Let us think about this and while we are raising the educational requirements of dental students let us also raise our own. The beams are not all in the eyes of the students; there are a few practicing dentists who have ocular motes as well.

Just a few words in conclusion. In the writer of the essay under discussion I feel that we have the ideally constituted man to carry on the great work begun by Doctor Hunt. By his long service on the state board, Doctor Henshaw knows what dental graduates need; he has the brains and the ability and the indefatigability to give it to them; his ideals are high. We, the members of the Indiana State Dental Association, look to him more than to any other one man in the state, to advance the education of the dentist to a higher plane. I firmly believe he will not disappoint us.

Mr. F. B. Johnson: Much as I should like, I cannot qualify as a doctor. As the last speaker read those questions and answers, it struck me I was much in the situation of the boys who answered those questions. I am not going to congratulate you on the progress you have made professionally. I take it you are all good dentists; I know your standards are high. Each time I come in contact with dentists, collectively or individually, I am amazed at the professional standards you seem to have. Here is a profession less than one hundred years old, and from my experience with you and also in the allied medical profession, I want to register it as my profound conviction that the professional standards and standing, the professional ideas and the professional ideals of the dentists in this state are superior to those of the two so-called older professions. I do not know why that is, but state it as a fact. Here you have about 700 members out of 1,100 practicing dentistry in the state of Indiana. That is remarkable. This is evidenced also by the fact that you are giving this 1915 meeting of the Indiana State Dental Society, and the meeting is solely an Indiana meeting. That is impressive from the outside.

There is one thing I, as an outsider, want to say to you. You may say the charge is not true, but later when you think it over I believe you will admit that it is. Although your professional and individual standing and standards, ideas and ideals are of the highest and best, yet you are not of the highest, best and greatest type of citizens. The dentists don't take the interest in the community life, the social life—not in the sense of bridge parties, but in the larger and more extensive social sense; you don't take enough interest in the communities in which you live. It has been my privilege to come in contact with many groups that made for a socializing uplifting influence. We find doctors there, of course we find ministers there, priests and rabbis, and, God save us, we find plenty of lawyers there, but we do not find the dentists. There are civic groups in the towns in which you live, there are state civic groups in this state, and there are national civic groups, such as the National Peace Society, all of which you could contribute something to. You get nothing out of this, of course, in a dollars and cents way, but if you put something into it you will indirectly grow by giving. I don't think the dentists do enough of that. When the late Elbert Hubbard, who developed somewhat into an advertising charlatan before his recent death, but who, nevertheless, was a keen thinker and the finest handler of the English language who has lived for many years, said to me in a conversation some years ago, before either of us became famous, "Young man, you get out of things just in proportion as you put into things, and you get by giving." I didn't understand that. Still, that is so. And that is what you should do. You should identify yourself in the community in which you live with the community life. Politics is part of it—I don't mean that particularly, but any civic social enterprise that needs you. In being a dentist you are not only a dentist, but a human being with high professional standard, and that standard demands that you give of yourself to the community in which you live. These are troublous times, times when it behooves all of us to give the best that is in us for the civic, city, state and national good. Because you are professional men, you have that obligation to the society and the community in which you live, and you cannot relieve yourselves of this responsibility and obligation by saying that you don't know anything about this particular question. For you must always remember one thing, that by reason of the fact that you do not know intimately the detailed plan that should be followed, that very fact gives you a perspective of common sense on any situation that a group of high minded men, working for the good of the community, will find absolutely invaluable. Get interested in the community life in the town or state or country in which you live.

Dr. W. H. Shaffer, Manchester: Doctor Henshaw's paper is a most fascinating one on a most vital and fundamental subject. He delightfully brings to view the enlarged possibilities of dentistry. Possibilities that must and will be attained and sustained if dentistry is to hold its place among the professions of the world. The progress and advancement in oral surgery and mouth hygiene by dentists has challenged the attention and earnest consideration of the allied medical profession and has brought all to a fuller realization of the influence that oral infection has upon the general health of the entire system. When such men as Mayo, to whom might be added Murphy, Billings and Barnhill, who addressed us here last night when such men as these turn toward dentistry for aid and assistance in the battle of health over disease, it is indeed most significant. It clearly demonstrates the fact that the medical profession is willing and eager to co-operate with dentistry and that that profession is looking toward dentistry for a broader and a more extended scientific knowledge along this line. In truth, the medical profession is not unlike Oliver Twist—you know Oliver always "held his plate up for more;" and it is the business of dentistry to supply this demand. We owe much to the medical profession, but we owe more to the general public. Almost every state and territory of the United States has enacted good, wholesome dental laws on the theory that it is a protection to the general public against incompetent dentists and incidentally a protection to those already in the profession. So a four years' course of study, a broader and a more rational scientific course is a long step in the right direction.

After all, a four years' course may not solve the entire problem. It is often, very often, the man more than the time spent in college. Frequently it is a case of a four-thousand-dollar education on a four-dollar boy. In one of the colleges in the northern part of the state the new Irish janitor was watching with amazement the adjustment of a telescope to the stars. Just then a star fell. "Begorra!" exclaimed the Irishman, "that fellow sure is a crack shot." And so when Doctor Sexton strongly advocates an efficient preliminary education for entering a dental college, he sure is a crack shot. No young man or young woman should be allowed to enter a dental college or a medical college with an untrained or uncultured mind. No one should be admitted into a college who does not know how to study and how to think. True, there is a preliminary entrance requirement to college of a high school education or its equivalent. But in the struggle for students the colleges have made the word "equivalent" most elastic indeed. It is often like paint—both house and face paint—"it covers a multitude of sins." There is another thing to which I wish to refer and of which I have often thought —whether practical or feasible I am not prepared to say—but it is this: say after three, four, five or six years' practice and experience, make a post-graduate course in some recognized college compulsory. Whether practical or not, if put into vogue we then would certainly have better "educated dentists."

Dr. H. R. Raper, Indianapolis: The answers given in Doctor Sexton's paper are amusing, but I think they are misleading. You would suppose, hearing those answers, that there were a large number of such answers. Of course, one is too many, but the fact remains that as the papers are handed in, I will wager the men who grade them are surprised as much one way as the other, surprised to find so many excellent answers as to find so many poor answers. Is that true or not, Doctor Sexton?

Dr. Sexton: Sometimes.

Dr. Raper: One point in Doctor Henshaw's paper is of particular interest, that bearing on the training the boys are starting to get along business lines. I went through the Forsythe Institute for the care of the mouths of poor children at Boston a week or so ago, and it was the time of my life when I was proudest that I am a dentist, because there is a building a square long and half a square deep, made of marble, with everything in it to make a proficient infirmary for that work. Their extracting rooms are surgeries in every sense of the word. This institution will do more for the health of the community than any other one thing in the history of the world; it will prevent more disease than any other single movement. Why can it do this? Because the institute rests upon a firm financial basis. As long as the dentists of the world have their practices on such flimsy financial supports, they will have difficulty in building a beautiful professional structure. For a year and a half I worked hard trying to show the profession at large that to give the best service to humanity we would have to use radiographs occasionally. During that time I would receive a letter occasionally from some fellow moderately interested. Then I wrote one paper, "Dental Radiography from a Business Standpoint," and showed the profession that by investing in a radiographic outfit they could realize at least twenty per cent. on the investment; and the office was flooded with inquiries as to where they could get a machine. On the face of it that seems an indictment of a profession that serves the public, but it is not. Nobody can do anything for somebody else and continue to do it at the expense of himself. It is just as wrong to be unfair with yourself as with anyone else.

Doctor Schaffer takes part in the discussion which rages about the word "equivalent." In speaking of this matter I want it known that I speak as an individual, not as a representative of the Indiana Dental College. It is my opinion that that word "equivalent" has let some of the best men into the ranks of the profession. Recently we accepted a boy. He went to his classes, the mid-term examination came, and he passed with the five or six at the head of his class. Then the registrar happened to refer to his credentials, and found that he didn't have a high school diploma; so he had to go back and make up some credentials. Sending a boy to school before he enters a dental college may not fix everything, Doctor Schaffer. You will have exactly the same kind of answers. If there were a way to trace it, I could show you that some of those answers were given by boys who had the best preliminary training, or they at least had the papers to show it. The keynote of the whole situation is generosity; not generosity to the point where you give someone something they do not deserve, but be careful about adopting the thing you think will solve everything, because the chances are you haven't got it.

The President: There is a gentleman present from outside the bounds of this state who has been here to our conventions sixteen times. I am going to call upon Doctor West, of Chicago, to discuss this paper.

Dr. Geo. N. West, Chicago: I enjoyed the paper very much. It is a timely one on a subject in which I am much interested. I have the honor to be a member of Doctor Wheeler's committee. A number of points have been brought out, one of which I wish the colleges might emphasize more, and that is post-graduate work for the dentists who have been out of college for a number of years, in order to do away with these fly-by-night schools we find about the country. We have a couple of them in Chicago, one conducted by a physician, and when you mention his name to the medical profession, it is a joke; but he runs an institution of learning(?) under the lax laws of the state. Another man is giving instruction in a single branch of something we are interested in, and he is not a dentist; still, giving a post-graduate course. Our colleges should take these students themselves. Instruction should be obtained from the colleges and not from these so-called schools. I want to bring to you greetings from Dr. D. M. Gallie, President of the National Association, from Dr. J. P. Buckley, now President of the Illinois State Dental Society, and from Dr. F. B. Moorehead, now President of the Chicago Dental Society. They hope to meet many of you at the Pan-American Dental Congress in San Francisco

Dr. E. W. Ream, Crawfordsville: There is no subject before the dental profession at this particular time that is so engaging as the subject of this paper. I have had occasion to look over about fifteen catalogs of dental colleges recently, and there isn't a single catalog but what shows an increased interest in the subject of physical diagnosis. The fact that this subject is being taken up and the curricula of study increased along this line shows that the dental profession is awake to the situation.

Even before the establishment of the first dental college there existed requirements for a better dentist, and with its beginning the faculty of that institution as well as all following dental college, faculties have attempted to make better dentists of their students. That sharp "prod," competition exerts naturally an influence to the end of a better dentist as between colleges.

The *people* are beginning to understand that some practices of present-day dentistry are inimical to health, and they are going to *demand*, and when this happens, the better dentist will be forthcoming.

Doctor Jacobi, Evansville: The trip to our state meeting is always looked forward to, and we always go home with the firm determination of becoming better dentists and doing better work. After hearing this paper of Doctor Henshaw's and the discussion of it, how can we help but go back home and do better work? not better routine work than we have been doing—of course we will do that—but to better educate ourselves to meet the possibilities of the future. Doctor King said yesterday he wished we all might be dreamers and have higher ideals, and that Indiana at this time had confined the clinics and papers to members of our own state, to bring out the latent talent here, and place Indiana where she deserves to be placed in the dental world.

Doctor Armstrong: I see two of my classmates here—we graduated in 1891—Doctor Williams, of Terre Haute, and Doctor Curtis. I am glad I am here; it has done me good. As the last speaker said, we get enthusiasm to be not only better dentists, but better men. Two things have impressed me. One is this: Doctor House said: "Make your bridges with half crowns, and leave the margins free." Doesn't that sound good? Our brother from Peru, on pyorrhea, was fine, but the one point above all is the proper diagnosis of our cases. Convictions are more dangerous enemies to truth than lies. A man will do as much for error as he will for truth, if he believes the error truth. We often hear it said —and this is Elbert Hubbard; he was radical, but he was wise—"A man is not in business for his health." He said: "A man who is not in business for his health will never have good health or much business." Heed that. If you don't get your happiness out of your business you don't know what happiness means. The greatest thing in the world is truth, the strongest force in the world is truth, and the only law in the world is truth. Truth is an invisible, indestructible chain that connects each cause with its corresponding effect, and each effect with its corresponding cause. Other things being equal, the same cause always produces the same effect; the same effect will always be produced by the same cause. This always has been so, is so, and always will be so. Whether we know it or not, whether we believe it or not, whether we like it or not, changes it not. It is so in all philosophy, in all science, in all art and in all life, plant, vegetable or animal and just as sure as it is so in all philosophy, science, art and all life, so sure is it so in dentistry. There is no such thing as the supernatural; mysteries must be taken away from things. The natural is Divine.

Doctor Henshaw (closing): I believe that fundamentally, and that is the only basis on which we can go, we are all absolutely agreed,as to what we are after. We may not all be exactly agreed as to how we are going to get it. But if we are agreed on the thing we are striving for, I am willing to take the chance of arriving at it. We are going to get it, and you may depend upon it.

PRESIDENT'S ADDRESS*

BY DR. A. W. MC CULLOUGH, PITTSBURG, PA.

I GREET YOU AND BID YOU WELCOME to this the thirty-fourth annual meeting of our society. I desire to extend a most hearty greeting to our distinguished guests, also to our visitors and trust you will have a pleasant and profitable visit with us.

I also wish a hearty welcome to our exhibitors, who have come to our meeting and have spared no pains in giving to us the best and latest they have to offer; we feel grateful for their efforts in behalf of the society.

I want to take the opportunity at this time to express to the members of this association my deep appreciation, and thank you most kindly for the great honor you have conferred on me by making me your president, and the cordial and hearty co-operation and support you have given me, which has enabled me as your president, with the aid of the numerous committees, to give to this society the best and most up-to-date material the profession affords.

We have reason to feel proud of our year's achievement, our monthly meetings were well attended, good interest manifested and well selected, thoughtful, carefully prepared papers presented.

The first of the year we gave you some "Dental Medicine;" then "Something About the Pre-Historic Man," "Building a Practice With Two Profits," "The Fee Proposition," "Sins of Omission and Commission," and then following all this, "Is It Really Worth While—What Have You Gained or Lost By It All?" and our last meeting on "Thrift" touched the keynote and drove the straight truth of our position more keenly home than we are wont to believe.

Some such program for the coming year with its suggestive improvements, I would think most advisable.

I take the opportunity at this time to express my appreciation, and in behalf of the society, to thank the Lee S. Smith & Son Co., for the page allowed us in the *Oral Hygiene* for our society airings. The editor, Dr. Lawrence G. Singleton, merits mention and commendation for his timely and readable writings. But do you know there are a lot of the boys who never saw it? Some of the boys don't have time to read, don't have time to even mail return post cards, don't have time to attend professional meetings, don't have time to recreate, hardly time to eat, don't have time to associate, no time to laugh, hardly time to go home at night.

Josh Billings says: "If a man kan't find time to laff, there is some mistake made in putting him together, and if he wont laff, he wants as much keepin' away from as a bear trap when it is sot."

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*Read at Odontological Society of Western Pennsylvania, 1915.

The members of this society deserve the highest compliments for availing themselves of the opportunity of the several post-graduate courses taken advantage of. The small club organizations seem good family workers. May they be encouraged and grow in numbers.

In viewing the happenings and recent developments in dentistry, I feel strongly that the dental profession is about entering on a new era—everything that progresses has its spurts, and I feel that our progress has entered on a strong upward plane, and of these matters I wish to touch upon in a brief way. There is no profession or vocational work which demands a higher type of man physically, mentally or morally than dentistry.

Physically, because the profession, due to its close confinement and little real physical exertion, requires a good strong animal type to be able to pull the required working years of an average life; and few will allow, due to the close physical position necessary to work, a bad breath, a bad breather, a diseased person, or one having a physical deformity, to long continue as their professional advisor; and right here one of the very best investments you can make is to learn to recreate–at golf, tennis, planting flowers, gardening, or be a chicken fancier. Most dentists try to work too many hours, mix too little, too much wear on the physical machine, hence become old at an early age. Learn to conserve your health.

Mentally, because keenness of judgment and quickness of action, a saver of time and the dentist's capital.

Morally, because no profession may lend more temptation to the unscrupulous person, and as professional men we must hold ourselves above reproach.

An office assistant I hold as indispensable in a well regulated working practice. The oral hygiene movement, the prophylactic movement, the public school free dental clinic, and the many other advanced movements in progressive dentistry are fast making the position for a dental nurse obligatory, and we trust ere long our colleges or some school for this preparation may be worked out and sufficiently established.

We have at last, through constant efforts, brought to the notice of the medical profession and the world at large the importance of the oral hygiene movement. It is pretty well recognized now and accepted and the respect for it and us will continue to grow.

The physical degeneration of the race caused by tooth disease, or mouth disease, is more widely spread than has been appreciated. In the last few years the outlook of the dental profession has undergone quite a great change. There was a time when filling a carious tooth and extracting the more offensive, the dentist thought he had done his duty; little did he appreciate the more important obligation of his position as guardian of the mouth, the principal portal of infection of the whole body. But when such men of investigation as Gilmer, Price, Billings, Rosenow and others tell us of their findings and discoveries, and tell us that one of the principal, if not the principal, source of septic infection in the whole body is found in the mouth, and that such conditions as inflammatory diseases of the eye, the skin, joint disease, neuritis, endo carditis, and many others, can be traced directly to mouth infection the profession must take on a more serious aspect.

Dr. Morris Manges, of New York, in a paper on "Mouth as a Means of Diagnosis," makes the assertion that there are eighteen different diseases which can absolutely be diagnosed from the mouth.

It is well to cure our patients when they become diseased, but it is far better to prevent disease by teaching the people the importance and care of their mouths that they may not suffer from diseases, primarily brought about by lack of mouth hygiene.

The public school board has propounded a progressive step in this city, in establishing the free dental clinic for deserving school children. It is not only a pain saver and a comfort to the youngster, but an economical saving to the city as well. The medical and dental professions, through the hospitals, are working more harmoniously together and we believe ere long, a dental intern and a consulting oral dental surgeon, with complete equipment, will be a part of the working staff of every progressive hospital.

We further believe that the intimate connection between dental origin and general disease which has been so much brought into prominence, points very strongly to the necessity of a high standard of medical knowledge in the profession. And while we may yet be far from the day, a college preparation in the medical branch, combined with a dental degree, should be an ideal before us, and however unattainable it may now appear, it is not too much to complete our efficiency.

Dentistry as a specialty is again subdividing itself into specialties, each one a life work; and as one studies these things more, this importance is borne in more and more upon the investigator.

In the matter of painless dentistry, much has to be done yet. In spite of the claims of the adherents of nitrous oxid and Fischer method, much has to be done to get the ideal way of doing things without pain. How it is to be done remains to be seen, because so far neither the inhaling nor the injection method seems to be along the right lines, and I am looking forward to something radical and altogether different for painless dentistry.

Emetin, as used in pyorrhea, so far has received praise from investigators and is one of the latest adjuncts to the profession.

The cure of pyorrhea will be one of the greatest blessings to both the public and the dentist as well. But there is a great deal of work yet in investigating along these lines.

Mr. Supplee by his method of taking impressions with the mouth closed, has conferred one of the greatest boons on the profession, since the Taggart inlay, and cannot be too highly appreciated.

When you realize the way we are now being recognized by the medical profession, other professions and the public at large, as guardians of the most important gateway to the body, the gateway that is responsible (as has been proved) for the infection of some of the most dire diseases the body is heir to, when you grasp the significance of this, then the importance of our trust is borne in on us—and if we fail or don't come up to the mark, or we find ourselves too small to handle the job, great will be the criticism for us and the pointing of fingers in derision.

From my hearing of most president's messages heretofore, there has seemed a tendency to rest back complacently and pat the profession on the back for what it has done, and I wish for one to prove the exception and to point out what has to be done in the future. Understanding at the same time that we give decided credit to the men who have done things and not losing sight of the fact, still we wish to remind the profession that never before have the eyes of the world been focussed on the dentists as today, or so much expected from them.

Our work must deal with preventive dentistry, not expert and diversified means of mechanical patching. If we can find some means of stopping the teeth from decaying, then we will have accomplished renown.

Along these lines I suggest that dietetics be taken up more seriously than heretofore. Pyorrhea has been suggested as only an aftermath of wrong eating, and kindred ills of the oral cavity generally can be traced to wrong combinations of food; and seeing that in the best medical colleges only sixteen hours in four years is the time given on this subject, it will have to be for us to give it more serious attention, since the lack of attention causes us so much trouble.

The matter of post-graduate work has taken quite a boost this last three years. Heretofore only a man here and there had temerity to go away and learn to become more proficient along certain lines, but now quite a number are recognizing the importance of post-graduate work. To this end I wish to call your attention to the importance of forming small study clubs of men in your immediate vicinity, even three to twelve strong, to investigate along theory and business lines and to co-operate with one another, inviting men from other clubs to give papers before you and tell you what is doing. A dentist who does not belong to a live dental club is behind the times. This can be positively proven. Special lecture courses are being inaugurated by some of our colleges and meeting with much favor.

Each man should resolve himself into a committee of one to dig out some dental hermit, who acts as a brake on the profession and pulls back the wagon of progress, while other men are pulling it up the hill; and when this wandering one is reclaimed, personal and petty differences should be thrown aside and the bigger things of the profession promulgated.

Although we have a goodly gathering here today of representative dentists, still there are not enough. The trouble is the men who need this meeting most are not here.

Another thing I want to mention: a new wave is passing over the country, the fifty-fifty proposition—fifty per cent. theory, fifty per cent. business. Fifty per cent. business to show the dentist how to estimate a contract, by adding the different items of overhead cost into our individual salary so that every piece of work has a profit of its own, and not the way it is now, one piece of work paying for another—sort of a half precedented guess business.

Look around you and you will find that as a rule the manufacturers who turn out the best goods for use by the public are also the best business men. Dentists are not good business men. Dentists and professional men as a class do not stand well with Dun and Bradstreet. They work hard enough, too hard perhaps, but lack in business practice. We must remind you that every day we are getting older and that our prescribed time for practice is getting close to the end—the time to make more money than you can spend is before you reach fifty-five.

The history of dentistry furnishes numbers of striking instances of weakness in its larger and more important undertakings, due to lack of efficient organization and consequent inharmony of effort. Personal and sectional interests have been permitted to become paramount in too many instances rather than the general professional welfare.

It is a regrettable fact that of about 4000 dentists in Pennsylvania only about thirty per cent. are members of the state society, and previous to the state becoming a component of the national, that we should have less than 400 members of the National Society. The inability of pers sonally attending these meetings matters little, if you have the big thing- of your profession at heart. You get its proceedings, you lend your influence and swell the number, and it is worth all and more than it costs you. I earnestly commend the stimulation of small club societies, meeting as small families of larger societies, these components of the state, and state components of the national. And until this most complete organization can be effected, representing not only a few of the working force in the profession, while a great majority of selfish, unconcerned, remain idle, parasites or dental hermits, will we be able to claim what justly belongs to us. And until then our state congress, our national congress, will decline to legislate for the profession unless we can present in bold numbers, and have behind it not only quality of men, but numerical strength as well. Otherwise too many large activities of legislation are foredoomed to failure for lack of harmony of sentiment and unity of action, working together as one body for a common cause.

And in conclusion, gentlemen, may the live fiery spirit of enthusiasm, that has so much become a part of the members of this organization, and of the profession at large in this section, continue to develop and improve, and may we in harmony of effort, in theory, in business and in organization succeed with the sub-club smaller working units, in placing the Odontological Society of Western Pennsylvania second to none in the state.

Diamond Bank Buildign

REPORT ON PRESIDENT'S ADDRESS

Your committee appointed to report on the president's address begs to submit the following: First, that we wish to congratulate our able president on the successful year of his regime, and for his untiring efforts to give to this society the best and the newest things, as they presented themselves to the dental profession, also for his very able address, in which he has called our attention to some very important subjects discussed during the year which would be well worth our time to investigate and study more thoroughly, namely, dental medicine as presented at one of our meetings, "The Prehistoric Man," "Building a Practice with Two Profits," "The Fee Proposition," "Sins of Omission and Commission," the evening spent on "Thrift," and together with the present meeting will give us food for thought for many years to come. He calls our attention to the page in *Oral Hygiene*, which is well worth our time each month to read. We endorse most heartily his recommendation to the forming of small "Study Clubs" or classes among our members and to co-operation with this society. He calls attention to the great need of the dentist having some definite form of recreation so as to conserve our health. We agree with him that it is a well established fact that an office assistant is indispensable. He speaks of degeneration of our race, due to the eighteen different diseases which can be absolutely diagnosed as coming from the mouth. He speaks of the progress of oral hygiene in our public schools and hospitals which need our co-operation; also the higher standard in college preparation together with a medical and dental degree. Painless dentistry as practiced today is not the ideal way, but there must be something radical and altogether different from the present methods.

The greatest subject in dentistry today is pyorrhea, and how can it be cured. We are still investigating for this cure. He speaks of the Supplee method of taking impressions with the mouth closed. He emphasizes the importance of preventive dentistry and suggests that dietetics be taken up more seriously. He emphasizes the fact that there is such a small percentage of the dentists that attend the various dental meetings and have become members.

Your committee would recommend that a vote of thanks be extended to the retiring president, Dr. A. W. McCullough, and his associates, for the very able manner in which the meetings of the society have been conducted.

Respectfully submitted by Committee on President's Address,

W. H. HAINES, *Chairman*,
J. A. PENNINGTON,
C. B. BRATT.

PROHIBITIVE DENTISTRY*

BY DR. EDWIN S. HULLEY, D.D.S., MARION, INDIANA

I AM NOT GOING TO TRY to commercialize dentistry, having miserably failed for a number of years to do so. Not going to take away from the profession when I have added nothing to the profession. Not going to establish what you shall charge per hour or per fee. But I believe in a minimum fee bill, a business understanding with the patient, an approximate estimate with allowances for unforeseen work.

We owe to ourselves and our patients a definite understanding as to fees expected and the payment of same, thus avoiding misunderstandings and ill feeling. We have left the educational part as to fees and dental services to the unethical man all these years. The public in general need education both from the professional and the business standpoint.

> "Heights by great men reached and kept,
> Were not attained by sudden flight;
> But they, while their companions slept,
> Were toiling upward in the night."

An appropriate dental dedication: heights of success attained by toil and labor.

Years ago a wise class of freshmen was warned by the Dean against believing that dentistry owed anything to the individual, but that the individual owed everything to dentistry. Toil, effort, labor; then perchance we could attain success. Faith in purpose, love of service and strict adherence to business principles would be a good slogan.

It just seems that there are so many underlying phases to dentistry, so many subjects under one heading, that were we to spend the remainder of our days in post-graduate work, we might be qualified to practice. The business side of a practice keeps some of us hustling to keep step with progress.

Papers and reports of clinics we can take up through the excellent journals. The research work and new methods of proceeding are thrust upon us by both journal and progressive manufacturer of dental supplies.

We are all greatly interested in the doer of deeds, and the clinics have become so popular and crowded that out of necessity progressive clinics were given us. But over in the corner of the crowded hall, out in the lobby, in small groups, classmates perhaps, friends maybe, brothers in the profession; yes, earnestly talking on this one subject. Well, brother Bill has helped us; we made good resolutions. A good course in salesmanship helped us. Yes, we put some of our $50.00 course in effect. Modern equipment and time-saving devices did a whole lot; yes, more than we can think of.

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*Read before the Indiana State Dental Society, 1915.

Certainly upon the individual dentist rests the burden of responsibility whether success or failure crown him. You know it just as well as I that all-around ability, in its every sense, is so large we'd take up the time of this and many other meetings to even define it, let alone discuss each point. Yes, the subject—how to legitimately increase our practice without resorting to unethical manners, or, as our brother in Chicago puts it, "making the Golden Rule a workable rule to guide us." Entirely too big a problem for me.

We all depend on our skill and ability to perform to the best of our knowledge every operation which comes to our attention; to successfully meet with all the requirements, both from the patient's standpoint, because it is from him we receive the well-done or otherwise, and from the standpoint of our own best interests.

How often after days and hours of hard labor, on presenting our fee for consideration and payment, do we hear both sides of the fee question discussed. Is it always, "I expected it to be double the amount and I want to thank you for your services, and especially to thank you for your reasonable charges."? Is not our patient's ability to pay and his appreciation one of the great points in our work? You will understand that we are only treating this subject from the standpoint of the professional man who is dependent on his practice.

Unless we are very careful to please and satisfy our patients, both as to services and fees, we do either one of two things, or both: We fail to keep in their good graces and thereby lose their patronage, or go one step further and make an active knocker.

So many men have taken up the idea as a practical method of making a chart of work to be done, placing a definite amount approximately opposite the notation of each tooth, making a careful estimate, explaining just what each piece of work consists of, going into detail and illustrating with samples, giving the patient a clear idea as to what will be required.

Personally this appeals very much to me, and has been tried out in part, with the addition of getting a very definite idea as to the terms of settlement. It is too often the case that a patient who is entirely uninterested in what the fee will be is often less interested in when the fee will be paid.

If the fee is understood, if the work is well done, the patient pleased and has a kindly feeling for his dentist, a link has been added to an endless chain of a successful practice building. Another case: Patient presents case requiring great expenditure of time and money. Work completed, statement sent in, and there comes to the dentist one of those typewritten theses of how to conduct a practice, ending up with the advice that patient is dissatisfied with work—and no check forthcoming. The very nature of the operation may have been wholly unintelligible to the patient. Education as to requirements and what he could be expected to pay would have changed the case from a disgruntled patient to a pleased and grateful one.

This case may have been a case of prohibitive dentistry, should he have known what was expected of him and of you.

Last Friday I asked one practitioner how he proceeded when in doubt as to patients' financial condition, and his reply was: "Well, I hint around and let them know that I expect a payment before work is completed." When asked why he did not use straight-forward business methods, he said he didn't know why, but he just didn't.

I wonder if there are any others in his class.

Now, how do you arrange to average up Mr. T. R. Cain and Mr. T. W. Adam? Will the fee in one case be prohibitive as in the case of the other? Or course, all of us are not as fully equipped mentally, or in our offices, nor are we equal in our ability to perform the general dental services, but we can get to the basic facts, have a basic charge per hour for services rendered and strive to keep to a standard of efficiency.

Should each town or city society get together and arrange a minimum or maximum fee schedule? How does it work, you men who have given it a trial? This sliding schedule makes me think of Ollie's sweetheart when telling about her Ollie who played trombone in the orchestra. The leader got $100 per week and Ollie got $15 per, only Ollie "got him." Isn't there a definite method of getting into this "got him" class, or shall we just go on indefinitely taking the leader's chance?

To install in our offices up-to-the-minute appliances, to conduct our homes in the way they should be run, to pay our obligations as they fall due, requires the patient to pay for our service—not exorbitant or prohibitive fees, but fees which will cover all costs and a good saving per annum. The estimate sent out some time ago by The Ransom & Randolph Company of $2.35 per hour, cost of time in a $5000 practice, does not figure right, because most of us want a two months' vacation.

So many people applying for our services are in absolute ignorance as to our methods and basis of charging. To take in a strange patient, perform services required and never mention what we expect of him is an injustice to him and works an injustice to us. It's the lack of enlightenment which causes so much disturbance. Education won't help a great number of people, but it prohibits them from using our time, allows us to give our services to those who do appreciate them and are willing to meet our demands.

Take up the business side of every case with as much care as we go into the professional side, with just as much earnestness, and have the definite understanding whether it be $5, $50 or $500 fee. Then we don't have to hint. We owe it to our wives and sons and daughters.

We can study the salesmanship course, we can read Brother Bill; in fact, some of us are looking up on George Wood Clapp as the emancipaton from financial ruin; we can stand off the supply house again, we can grow gray headed, bald headed and crazy discussing these subjects in bed when we ought to be devoting the night hours to sleep and refreshment. Yes, we can manage to "get by" somehow, it is true, but can we take home anything of more value than a good clear-cut business plan to use in our work to parallel with our professional work?

Lots of us are dated way ahead on our appointment books as well as on the supply house books. Is it practical for each local body of dentists to establish a minimum fee list, and thresh out this subject? Can we put aside personal ideas long enough to get together and stay together? Can we get the other fellow to see the light of a local society, a district society, a state society, a national society, a harmonious village, town, city—a united dental society?

Just to show how deficient some of us are, a certain dental supply company offered to extend us a 30-day charge account provided we answered a list of questions strictly confidential, used as a reference record by them alone, as to whether or not we owned our homes, if encumbered, for what amount, list of other investments, name of our banker, a list of three responsible business men, etc.

We have done business with people without asking address even on six years' time and no settlement yet! Have you? I'd be like the Jew who wished with the Irishman—the Irishman having wished for all the money in the world, the Jew only wishing for the Irishman's address.

As a rule, if we know the prospective patient even has a bank account, we can arrange to put off some one we are not so certain about even if we do hint for their address.

An Indianapolis dentist at the last meeting told me in all sincerity he believed all dentists were —prevaricators, I'll say, when it came to the financial side of their practice. I know one who is, 'cause I've worked for him for twelve years.

As Dr. Geo. Cook used to tell of a classmate who wore out chairs changing patients; that he was so poor he could not even pay his rent, because he never finished any work, but he never could turn away a prospective patient.

If that poor fellow had made a thorough examination, a definite fee not prohibitive to himself or patient, had a definite understanding as to its payment, he could have maintained his own respect and have gained the respect of his clientele.

We can't all be equal in skill, we can't all demand the same fee, and get it; we also know we don't always deserve what we do get, but we can all do the very best we can, strive to do better, leave out lots about the other fellow, provide harmony and good feeling, and practice to a large measure the Golden Rule.

The public in general needs education, both from the professional and business standpoint. We as dentists need educating along the line of giving the best service to our patients within our power to give.

DISCUSSION

Dr. J. M. Doyle, Peru: The first point of vital interest that Doctor Hulley touched upon was the establishment of a minimum fee bill. We have established it in the city of Peru. Before February, 1912, we were not organized, conditions were in a bad state; then several of the dentists effected the organization of the Miami County Dental Society. The following May we established a minimum fee bill. We went before a notary public and took an oath that we would stand by the by-laws and constitution of the Miami County Dental Society, of which the fee bill was considered a vital part. Since then we have been going along nicely. You haven't any idea of the pleasant relations that exist, simply because we have established the minimum fee bill. There isn't another city in the state of Indiana with a population of less than 14,000 that supports nineteen dentists. There are not four or five dentists and a lot of bums, but all are real dentists, and are getting along well, simply because we have established this plan. It is not only from a pecuniary standpoint, but from the brotherly love that exists there now. There is absolutely no comparison between conditions now and as they prevailed before the establishment of that minimum fee bill, and that is sufficient to warrant any community in establishing the same.

A dentist told me yesterday that it would not do to let the people know we had organized and established a minimum fee bill. Why not? We are dealing with intelligent people, who believe in organization, who know that in union there is strength, who know that every organization calls for a certain degree of efficiency. The fee bill may not work successfully in Indianapolis, but in cities where there are from two to fifteen dentists, it is the best thing you can do. You must first organize, because you cannot establish a minimum fee bill without a good organization.

Doctor Hulley touched on how to proceed to make known the fee to the patient. Too many of us start work fearful to tell the patient the nature of the work and what it will cost. We do the work not knowing the patient's ability to pay, and when the work is completed we have a bad account on our hands. If every man will take his time on the first sitting to explain exactly the nature of the work, and will listen to no dictation from the patient, do the work to the best of his ability, and have the patient pay to the best of his ability, we will save ourselves untold trouble.

Dr. H. C. Carr, Indianapolis: The essayist has opened up a very broad subject, and one that will draw more discussion than any other in any society meeting. We all have definite opinions, and we think we are right. I like his stand in reference to this word "competitor." We are not competitors—we are brothers in the practice of dentistry, co-workers in a field for the alleviation of human ills. "Competitor" suggests to me the commercial spirit. There is no such thing as commercialism in dentistry. As long as it is commercial, it is not professional; and of all things, we are professional. One of the hardest things in the world for a dentist to do is to talk with his patient about the cost of his work and the payment of the bill. That, doubtless, comes because in the beginning our patients are limited, and we are eager for everything that comes our way, and are fearful of driving patients out of the office. But if we go to a store and buy a bill of goods and want credit, they do not deliver the goods until they know we are worthy of credit. We should, in a straightforward way, make arrangements, go into detail as to the nature of the work, and approximately determine what the expense will be and how the bill will be paid.

As to the minimum fee list, I do not like it. It looks too much like organized labor, and organized labor has no place within the ranks of dentistry. The personal equation should determine what the fee shall be. I may value my time at a certain amount per hour, and have a certain amount of expense to meet, and I will make a certain charge to my patients based on that overhead expense. There may be another man whose ideas are superior to mine, who may have patients whose ability to pay is greater than mine, and his fee bill will be considerably higher. I believe the fee bill as a rule is a vicious proposition. Some time ago several dentists were talking together, and one man related certain conditions, and discussed what fee he should get. One man said, "What is he worth," and he said that the patient had been to a very high priced man outside of the city. One man said to the crowd, "I would hang it onto him." I made the remark that I didn't believe we were justified in stabbing a man in the back just because he wasn't looking. A thing of that sort creates a bad feeling among the laity, because they feel that unless they make some hard and fast bargain, dentists will take advantage of them.

Dr. Price, Richmond: With reference to Doctor Hulley's letter from the other dentist, I never made a fee at long range. Patients will ask how much I charge for putting in a gold filling or for making a plate. You do not know anything about the conditions, and probably your neighboring dentist has made three or four failures on it because it is a difficult mouth. You say it will cost fifteen dollars. Nine times out of ten you will find it a losing venture. You cannot explain to them after they come in to have the work done. The explanation should be made before. I have them come into the office and look over the case, and then make an estimate.

I do not like the minimum fee proposition. We tried it in Wayne County, and it came nearly proving the rock on which the society was wrecked. It may work in some cases, but wouldn't work there. We are all good friends in Richmond, but if my neighbor wants to put in amalgam fillings at 75 cents, and treat roots for a quarter, that is his business and not mine. I tell the patient it will cost so much, and if he doesn't like my prices, that, of course, is his business. I charge what I think my work is worth, and I want my neighbor to charge in the same way. When a patient comes in, if there is any extensive work to do, I take the patient's name and address, and if he has been referred to me by some of my friends, I find out who they are. At the original sitting I never try to do any extensive work; I will excavate one or two cavities, and put in the treatment necessary to relieve pain, and then proceed to find out about the patient. And if I find out he is slow pay or something of that sort, the next time I put in one filling and tell him that it will be so much, I say, "We will follow the Golden Rule: I will do so much work, and we will settle at the end of each sitting." That is fair to both of us.

Dr. E. V. Burt, Lafayette: I believe every man who follows the profession of dentistry must look first to himself as to his ability, responsibility, and what he owes to his patients. If every dentist will do that, he will have no trouble with his fee. I never make any contract with a man for anything. I tell him that I will do the work as cheap as I can, and do it right, and if he doesn't want the work done, I do not do it. I get pretty good fees. Every man who practices dentistry and practices it honestly, does well, because there is money in dentistry if practiced honestly. It is not necessary to work for a man who doesn't pay his debts. I do not believe you need a fee bill or an understanding, but do your work and do it well and stand by it, and charge what you think it is worth when it is done. We must start in right. Merchants do not start in and sell goods at less than cost, and neither should the dentist. Every man who comes out of college should feel he owes much to the people, and the people owe something to him, because he is going to give them good service. If a patient wants to know what the price is, I have him come to the office so that I may see what the conditions are. No two patients are alike. You have to handle them differently, and it is a study, and every man should be conscientious and adopt the Golden Rule.

Dr. Roy Archbold, Decatur, Ind.: I am a believer in the minimum fee bill, and I think every small town should have one. Several years ago we had two men in our town, and if one man put in a filling for fifty cents, the other would put it in for a quarter. One of them died. He had practiced twenty-five years, and his estate was worth $5,000. He had one child, and had never spent his money foolishly. Some of us younger fellows came in and we saw we couldn't live. So we adopted a minimum fee bill. I do not believe we can get along without it, and I think it can be done in every small town, and if no one sticks to it but one, he is the gainer. We do not have the shopper any more. They say, "Well, it is no use to look any further, for you all charge the same." It gives one confidence.

I agree with everything Doctor Hulley said. As to wearing out your chairs, my experience has been that in a country town you may have twenty-five patients in your office in a day, and still not make a penny. We try to have regular appointments, but cannot do so in all cases, and if we simply work for a few patients, and do the work that day on those patients, we would be better off. I would advise every man with a country practice to adopt this minimum fee bill. We make more money and have a better feeling among the dentists. We close our offices on Wednesday afternoon, and are much the better for it.

Doctor Patterson: I do not think enough can be said in favor of the minimum fee bill. If a man extracts a tooth for a quarter, and then the patient goes to Richmond or some other place and is charged two or three dollars, he will either claim that the dentist is a crook or a faker, or a robber. I believe that is one thing to be said in favor of the minimum fee bill.

With reference to collecting, I try to get a small amount in advance. I ask for a little money down. Sometimes you have a first sitting with a patient and make a future appointment, and that future appointment is forgotten, and if you do not collect for your first sitting, your time is wasted. I believe in making settlements the first of each month. We are not working for the love of the work entirely; we must live, and have others dependent on us, and we should get the money for the service we perform, and if we do not watch the business side, we will lose. In our town we have a large percentage of farmers who come in and sell their grain and put the money in the bank, and they will let the dentist go along for six months while they draw their interest, unless he has an understanding with them. The supply house sends its statements to us the first of every month, and the dentist should meet them. If we do the work and charge what the work is worth, we should get the money for it.

Doctor Kibler, Indianapolis: I want to emphasize the feature of time. That is the first thing to figure on; how much it costs you to do business per hour. You must have some basis. You should figure the salary you should earn and how much you must save each year, so that when you cannot work any longer you have something to live on Until you have a definite understanding as to that you will go along haphazard and never get anywhere. You should have a definite understanding with your patient, because it is better to have a misunderstanding with your patient before than after. The idea of charging all patients the same fee is ridiculous. I should hate to think I would have to. You cannot expect the poor working girl to pay what the millionaire would pay, and the one who charges the millionaire the same fee as the poor working girl is not taking advantage of his opportunities. The advice of Doctor Doyle for men in a smaller city, I believe, is good. The trouble with the men in the small town is that one is jealous of the other, and the result is the lowest bidder gets the work. The quicker you all pull together, be friends, and have a minimum fee bill and stick to it, the better off you will be.

Doctor Brown, Ellwood: I want to emphasize the value of a comparative estimate. A girl came in at three o'clock in the afternoon and said she wanted a bridge. She said: "Could you get it done this afternoon?" I said, "I could not." She wanted to know how long, and I said two or three days. She said, "I can wait three days. Go ahead." I thought if she didn't know any more about how long it would take for the work, she wouldn't know how much it cost. I said, "Do you know the price?" She said, "Yes; I have been to another dentist, and he told me," but asked "What is *your* price?" I said it would be $40.00. She said "Forty dollars! I never had so much money in all my life. He said four dollars." So you see where I would have been if I hadn't made an estimate.

Dr. E. L. Mitchell, Indianapolis: Doctor Doyle attributes their success in Peru largely to the fact that they have a minimum fee bill. If this is true, it merely means they have brought about a brotherly feeling.

Doctor Carr, it seems to me, hit the nail on the head when he touched upon the two expressions, "competitor" and "practitioner." If by the application of the minimum bill the feeling of competition can be eliminated and a brotherly spirit created, results are certain. Without the elimination of the word "competition" from the vocabulary of the men of any town or city, in my estimation, the minimum fee bill can never bring desired results.

If we get results we must have the confidence of our clientele and collect our fees. This can best be accomplished by having a thorough understanding in the beginning. What the fee shall be, how it shall be paid, together with a thorough understanding of what is necessary that results may be accomplished.

In the practice of orthodontia, I have found a definite fee understanding, with a substantial payment in the beginning, followed by a subsequent payment of a specified amount on the first of each month, to be most satisfactory. They expect the bill and pay it. It is always necessary to incur some expense before beginning work, hence why not get an advance payment to cover this? An honest business man will always think more of you for exacting business principles. If he is a crook he may not like this, but you have learned to know him. I want to thank Doctor Hulley for his very excellent paper and say I have enjoyed it very much indeed.

Dr. R. I. Blakeman, Indianapolis: I wish to thank Doctor Hulley very much for this excellent paper. The conditions are so different in different places and with different individuals that this matter treated by the essayist is a difficult one. I saw a piece in the paper the other night on what has become of the "old-time doctor," the man who was ready at any time of the day or night to call upon the sick, and who paid no attention to whether he received his fee or not. The whole thought in his mind was in relieving that patient and in doing his duty as a physician. A few days after that it was answered by some bright fellow here, and he said that was all very well for the individual, but that such an old-time practitioner should be a bachelor, that it was really almost a crime for a man like that to raise a family. Perhaps it is the same with the dentist. I think this minimum fee bill is a good thing in a small town, and I think the plan of Doctor Mitchell is good for the men in special practice, where the fees are large; but I fear I couldn't very well do it. In the case of a child, for instance, it would be embarrassing to have to state just what the work is going to be, and send it to the parent before I did the work; I don't believe I could do that in my practice. On the other hand, we should not do as Abe Martin says. He says: "A dentist usually charges what he happens to need." Doctor Hulley's paper was very interesting.

Dr. E. S. Hulley, Marion (closing): If a man like Doctor Burt, with his successful practice, would give us a paper on this subject, we would get great value from it. What Doctor Blakeman told us as having been said by Abe Martin, does not, I think, apply to the majority of dentists nearly as much as does what Abe told of his neighbor, that he "had an 88-note piano—one due every month." I have had more experience with that sort of thing than I have with the other. I believe if we put in the time, and do the work, and merit what we charge, and have a definite understanding with the patient, we won't have to write the supply houses and explain how our life insurance fell due the same day we got their statement. I do like to have the bank balance on the proper side, and not on the side it used to be before we took up the business side of dentistry. Perhaps my patients feel that they are being held up, and I side with them quite often, too, but at the same time if we have all those arguments and contentions that arise over fees before the work is commenced, and if the work is prohibitive, then they are welcome to go elsewhere. That is the point I have tried to make, and I thank you for your courteous criticism.

EDITORIAL

Old Time Dentists

Early dentists adopted the practice of making announcements through the newspapers or by means of other printed matter, informing the public of the location of their offices and enumerating many things they had to offer.

There was no professional code of ethics at that time, in fact, none was created or adopted until 1866, and yet at this early date these announcements were not as objectionable as many to be seen today.

Some of these announcements, however, are interesting as throwing side lights on the development of the profession at that time.

In an old newspaper printed in Columbus, O., in 1849, there appear two announcements as follows:

Under the heading "Surgical and Mechanical Surgery," Dr. W. Wilshire Riley announced: "Having leased for a term of years a suite of rooms three doors north of my old stand, in Swan's new building, I am prepared to perform all operations in line of my profession, with promptitude and care, and to warrant my work in point of durability, neatness of fit and elegance of finish, not inferior to the best eastern work. I also restore the natural contour of the face in all cases where the cheeks have fallen in by reason of the loss of the molars and the absorption of the gums.

"Just received from New York a fresh supply of Alcock's premium teeth, which makes my assortment the largest in the state, which I sell at New York prices. Also for sale, gold plate, springs, foil and solder. Baker & Riley's forceps keys—a new article for extracting teeth, which will render useless Dr. Morton's Letheon, as they are perfectly safe in operation and produce little or no pain."

The last paragraph was evidently directed to the profession. Probably there are many dentists of today who could not tell what Dr. Morton's Letheon was. By way of information we might add that it was made up mainly of sulphuric ether and this somewhat disguised by the addition of essential oils or something of the sort. Morton claimed to be the first to use ether as a general anesthetic, and he patented his "Letheon" and sold office rights for its use. We have in our possession one of the original office right contracts issued in 1846 by William T. G. Morton to Doctors Bishop, Harris and Newton. The contract begins as follows: "Whereas, letters patent have been granted to said Morton, by the United States Government, for an invention, whereby pain is prevented or alleviated in surgical operations, and said Bishop and Harris and Newton are desirous of acquiring a license or right to exclusively use said invention, under said letters patent, in the practice of their profession as dentists, and for a term of seven years from date hereof now, therefore, in consideration, etc." Said Bishop, Harris and Newton agreed to pay Doctor Morton two hundred dollars, etc.

Returning to the subject in hand, the other announcement in this old newspaper referred to was that of Dr. W. E. Ide, "late of the firm of Crane & Ide, Cincinnati," and it reads, "has removed his office to Nos. 1 to 9 Neil's Exchange, opposite the secretary of state's office." Among the improvements that he has acquired by more than ten years' practice and intercourse with the profession, he would call attention to the following: "*1st*—A substitute for the file in nearly all cases of plugging teeth, by which the pain is essentially diminished. *2nd*—A method of adapting artificial teeth by which a more easy fit is secured and danger of injury to the natural ones obviated. *3rd*—A method of packing the gold by which fillings may be made more compact and durable."

Here is another announcement made in 1836 by G. H. White, of Springfield, Mass. He gives the location of his office and states that he "fills carious teeth so as to preserve them through life. Mineral Incorruptible Teeth set according to the latest improvements, on Gold Plate, or Pivot, so as to supply the loss of natural teeth for mastication. Thus persons destitute of teeth, or even 'old stumps' may have an entire set that will look perfectly natural, be durable, and almost as serviceable as their original natural teeth. Diseases of the gums and maxillæ will receive successful treatment. Also, irregularities in the teeth of children and young persons prevented and corrected. Teeth extracted with the improved forceps only. Tooth powder, brushes, etc., for sale."

We might quote many more similar announcements but these will suffice to contrast dentistry of years gone by with dentistry as practiced today.

The Season's Greetings

Before another issue of the DENTAL SUMMARY the old year will have ended and the new started on its twelve-month journey.

At this season of the year greetings and best wishes are freely given friend to friend.

The friends of THE DENTAL SUMMARY are legion and we take this opportunity to extend to them all the season's greetings, with the hop that their cups will be filled to overflowing with joy and contentment, and that the New Year will bring them abundant good health and prosperity.

SOCIETY·ANNOUNCEMENTS

Annual Clinic Chicago Dental Society

January 28-29, 1916, Hotel La Salle, Chicago

The annual clinic of the Chicago Dental Society bids fair to surpass in efficiency and enthusiasm our splendid clinics in the past. A notable list of clinicians has been selected and arrangements are under way for a clinic which will place before our guests and members the best in modern scientific dentistry. The evening meeting on Friday, January 28, will mark an epoch in dentistry. The banquet will be held on Saturday evening, January 29.

Reservations for rooms at the La Salle Hotel, Chicago, may be made any time. Banquet tickets may be had by addressing Dr. S. W. Fahrney, 25 E. Washington St., Chicago. The official program will be issued Jan. 1. Exhibitors desiring space may communicate with Dr. L. Strong, 30 N. Michigan Ave., Chicago.

Frederick B. Moorehead,
President

Percy B. D. Idler, *Secretary*
30 N. Michigan Ave., Chicago

The Tri-State Post Graduate Dental Meeting

Missouri, Kansas and Oklahoma

The State Dental Societies of Kansas, Oklahoma and Missouri wish to announce to the dental profession that they will conduct a joint post-graduate dental meeting in Kansas City, Mo., the week of March 20-26, 1916.

In making this announcement we believe it to be the most important step, from a dental educational standpoint, ever undertaken by any state dental societies. The meeting is to be conducted along the lines of the "Oklahoma Way" or the "Teaching System." At this writing several of the foremost teachers of the dental profession have been secured for lecturers, among whom are: Dr. M. L. Rhein, of New York; Dr. Richard Riethmueller, of Philadelphia; Dr. C. N. Johnson, of Chicago; Dr. Weston

A. Price, of Cleveland; Dr. Thos. P. Hinman, of Atlanta; Dr. Forrest H. Orton, of St. Paul; Dr. J. P. Buckley, of Chicago. Some noted medical man's name will be added to this list of lecturers.

Doctor Rhein will take up the subject of root canal work; Doctor Riethmueller, anesthesia and analgesia, both local and general; Doctor Johnson, some phases of operative dentistry; Doctor Price, some recent research work; Doctor Hinman, plastics (amalgam and cements); Doctor Orton, some phases of crown and bridge work, and Doctor Buckley, materia medica, therapeutics and pyorrhea.

Each person attending this meeting will be required to pay a membership fee of five dollars, and only dentists in good standing in their state society will be eligible to take this post-graduate course.

The Tri-State Bulletin and a program will be mailed upon request to anyone desiring to keep posted on the details of this event. For any information, address the secretary of the organization committee.

Charles Channing Allen, *Chairman*,
10th St. and Troost Ave., Kansas City, Mo.
C. R. Lawrence, *Secy.-Treas.*,
Enid, Okla.

J. D. White,
Frisco Bldg., St. Louis, Mo.
W. E. Flesher,
Frederick, Okla.

C. A. Martin,
Winfield, Kansas.
L. D. Mitchell,
Arkansas City, Kans.

Tri-State Organization Committee.

American Institute of Dental Teachers

The annual meeting of the American Institute of Dental Teachers will be held at Hotel Radisson, Minneapolis, Minn., January 25, 26 and 27, 1916.

There will be a number of interesting papers, reports and discussions by prominent dental educators. All dental teachers are cordially invited to be present.

J. F. Biddle, *Secretary.*

517 Arch Street, N. S. Pittsburgh, Pa.

South Dakota Board of Dental Examiners

The South Dakota State Board of Dental Examiners will hold its next meeting at Sioux Falls, So. Dak., January 11, 1916, at 9:00 A.M. sharp, continuing three days. All applications must be in the hands of the secretary by January 1st. Fee, $25. Address

Aris L. Revell, *Secy.*,
Lead, So. Dak.

Four Year Course in University of Minnesota

EDITOR THE DENTAL SUMMARY:

It may be of interest to you to know that the College of Dentistry, University of Minnesota, started the four-year course September 15, 1915, with a full class of students. (Our limit is 90 in the freshman class.) It may also interest you to know that some fifty or sixty students were refused admittance.

I also enclose the program of this course as it is offered at present.

Yours sincerely,
ALFRED OWRE, Dean

COLLEGE OF DENTISTRY—UNIVERSITY OF MINNESOTA—COURSE OF STUDY

	1st Semester		2d Semester		Total	
	Credits	Hours	Credits	Hours	Credits	Hours
FRESHMAN YEAR—						
Anatomy, Dental			2	64		
Animal Biology, No. 1 and 2	3	96	3	96		
*Chemistry, Adv. Gen. & Qual., No. 3 and 4	3	96	3	96		
English, Rhetoric No. 1	3	48	3	48		
Military Drill		48		48		
**Technical Drawing	2	96	2	96		
Prosthetic Dentistry	4	160	2	64		
	15	544	15	512	30	1056
SOPHOMORE YEAR—						
Anatomy, Gross	4	128	4	128		
Anatomy, Histology and Embryology	4	128				
Anatomy, Dental	3	96				
Chemistry, Organic	3	96				
Military Drill		48		48		
Operative Technic			4	192		
Physiology and Physiological Chemistry			6	192		
Prosthetic Technic	2	96	2	96		
	16	592	16	656	32	1248
JUNIOR YEAR—						
Bacteriology, General and Special	4	128				
Crown and Bridge Technic	4	192				
Dental Metallurgy	1	16				
Materia Medica and Therapeutics			3	48		
Operative Dentistry, Lec. and Rec.	1	16	1	16		
Orthodontia Technic	2	96				
Pathology, General and Special			4	128		
Practice	4	192	10	480		
Prosthetic Dentistry, Lec. and Rec.	2	32				
	18	672	18	672	36	1344
SENIOR YEAR—						
Crown and Bridge, Lec. and Rec.	1	16	1	16		
***Elective (may be taken prior to this year)	3	48				
Operative Dentistry, Lec. and Rec.	1	16				
Oral Surg., Clin., Path. & Radiog., Lec. & Rec.			2	32		
Orthodontia Lectures and Recitations	1	16	1	16		
Practice	12	576	12	576		
Theory and Practice of Dentistry and Conference Course in Applied Economics, Jurisprudence, Psychology, Ethics and Art			2	32		
	18	672	18	672	36	1344
					134	4992

*Students who have not had Elementary General Chemistry will take Course No. 21 and 22 Inorganic and Qualitative, 10 credits.

**Substitute allowed by the Student Work Committee.

***At least three credits must be obtained in Psychology, Economics or substitute subjects approved by the Student Work Committee and may be taken in the 1st or 2d semester, evening course or summer school.

One credit hour may be either one recitation hour through one semester, two laboratory hours with outside work, or three laboratory hours without outside work. One semester, sixteen weeks; one week, forty-eight hours.

NEWS and OPINIONS

CONDUCTED BY G. E. HARTER

WHAT IS DOING IN THE SOCIETIES

Indiana—First District

THE DENTAL SUMMARY is more than pleased to announce the addition of another society to the group for which it stands as official magazine — First Indiana District Society, a component of the Indiana State—which held its third annual convention at Evansville, November 22-23. If this convention contains within it any of the elements of prophecy, the new society is pretty sure to set a pace that some of the older organizations will find difficulty in following. The paper by Dean Henshaw, on "Pain Elimination: Its Uses and Abuses" and the discussion that followed, make up a distinct addition to dental literature. The entire meeting was a very successful affair, well attended. Following are the officers elected: J. M. Hale, Mt. Vernon, Pres., J. O. Zubrod, Evansville, Vice Pres., A. J. Kimm, Evansville, Secy. and Treas. The newly elected Trustees are, Drs. A. R. Ficken, Evansville, J. A. Brumfield, Princeton, S. F. Bosler, Rockport. The next meeting will be held, in Evansville, Ind., in November, 1916.

Ohio—Maumee Valley

The Maumee Valley Dental Society gathered for their semi-annual meeting at the Chamber of Commerce rooms, Napoleon, Tuesday, October 19. Most of the day was spent in giving clinics by members of the society. Dr. T. M. Semans, Dean of College of Dentistry, Columbus, Ohio, gave a lecture on conductive anesthesia; this was followed by a discussion on mouth hygiene of pupils of the public schools of the district. A general educational plan was agreed upon whereby free lectures will be given in all the schools in the district on the "care of teeth and mouth hygiene." One of the enjoyable features was the banquet at the Wellington Hotel, at which covers were laid for twenty-six. The visitors were so well pleased with the reception received here that they voted unanimously to have the June meeting here again. The following officers were elected for the ensuing year: H. D. Sweinhagen, Napoleon, president; D. C. C. Schwartzbeck, Bryan, vice-president; O. J. Wisman, Delta, recording secretary; N. Cunningham, Defiance, corresponding secretary; J. A. Benner, Defiance, treasurer; G. D. Edgar, Defiance, representative to state society.

Ohio—North Central

Dr. George B. Smith, of Fremont, was chosen president of the North Central Ohio Dental Society, at the third anniversary meeting of the organization, held at the armory at Sandusky, Wednesday afternoon. Dr. Smith celebrated his election to office by launching a campaign to have the next anniversary session of the society held at Fremont.

Other officers elected were: D. W. Stout, Norwalk, vice-president; D. D. Smith, of Sandusky, recording secretary, and F. S. Braithwaite, of Chicago Junction, treasurer. C. D. Peck, of Sandusky, was made chairman of the program committee, and Dr. Woleslagle, of Bellevue, was added to the committee. The next meeting will be held either in Bellevue or Norwalk.

About 80 dentists were in attendance at the meeting. A delegation of 30 came in a special car from Toledo, while a number of dentists came down from Cleveland in automobiles. The district covered by the society includes Erie, Sandusky and Huron counties. Delegates were also present from Fremont, Gibsonburg, Clyde, Bellevue, Norwalk, Milan, Woodville and Chicago Junction.

In the afternoon a program consisting of papers and clinics was given. After the invocation, by Rev. E. G. Mapes, two dialect readings on Christian Science were given by Charles Selkirk. Both were in a humorous vein and were highly appreciated by the dentists who were present.

Two papers were read, one by Dr. Guy D. Lovett, of Cleveland, on "Cast Inlay Work," and the other by Dr. S. Marshall Weaver, of Cleveland, on "Practical Bridge Work." Clinics were then held by the essayists, following a general discussion of the papers. A clinic was also held by Dr. C. D. Peck, who gave practical illustrations on the subject, "Removable Bridge Work."

At the close of the program officers were elected. Drs. Lovett and Weaver were made honorary members of the society. The meeting then adjourned and the dentists went to the Sloane house, where they enjoyed a fish supper. The meeting was one of the most successful ever held. The next session will be held the third Wednesday in January.

Illinois — McDonough-Fulton-Morgan

Quincy, Ill., Nov. 5.—The joint meeting of Adams-Hancock, McDonough-Fulton, Morgan county and Northeast Missouri dental societies, in session here, closed this afternoon. Adjournment was taken after a short lecture, followed by a discussion of the subject.

The convention has been such a success that it is probable it will be made an annual affair. Dentists in a radius of 100 miles attended the meetings, and without exception have all been enthusiastic as to holding similar events in the future.

The big banquet at the Hotel Quincy last evening was attended by about 200 members and was a success in every way. A sumptuous repast was served, following which J. P. Buckley, of Chicago, gave an interesting address upon "The Prevention and Eradication of Focal Infection of the Mouth."

The following are the officers of the various societies:

Adams-Hancock: President, G. K. Fleming, Carthage; vice-president, W. L. King, Quincy; secretary, E. C. Pendleton, Golden; treasurer, L. A. Meyers, La Harpe; librarian, R. S. Runyon, Carthage.

McDonough-Fulton: President, J. D. McMillen, Macomb; secretary, F. R. Lane, Macomb.

Morgan county: President, Charles Hopper, Jacksonville; secretary, A. B. Applebee, Jacksonville.

Northeast Missouri: President, J. F. Keeny, Macon; secretary, A. C. Alexander Kahoka; treasurer, J. E. Wright, Kirksville.

Illinois—Northern

Freeport, Ill., Oct. 21.—Officers for 1914-1915 are: President, W. C. McWethy, Dixon; vice-president, C. L. Smith, St. Charles; secretary, F. H. Bowers, Freeport; treasurer, B. H. Biglow, Rockford; chairman program committee, F. T. Bell, Aurora; chairman clinics committee, W. E. Tucker, Lena; chairman local committee, C. L. Snyder, Freeport. Committee on statistics on gingivitis, chairman, M. R. Harned, Rockford; A. D. Black, Chicago; W. C. McWethy, Dixon.

Illinois—Champaign-Danville District

Monticello, Ill., Oct. 28.—The following officers for the ensuing year were elected Tuesday at the district dental convention held in Monticello: President, F. E. Ebert, Champaign; vice-president, H. E. Minis, Danville; secretary, L. E. Wise, Champaign; treasurer, F. Conkey, Homer; librarian, R. W. Bushee, Monticello.

Minnesota—State

The thirty-third annual convention of the Minnesota State Dental Association will be held at the University of Minnesota in Minneapolis, Feb. 11th and 12th, 1916.

Illinois—LaSalle County

Ottawa, Ill., Oct. 22.—A. M. Kile, of Ottawa, was chosen president of the LaSalle County Dental Society at its meeting held in LaSalle, Wednesday. A. F. Schaefer, of Streator, was chosen vice-president; S. C. Wood, librarian, Oglesby; W. T. Perisho, secretary and treasurer.

Iowa—Corning District

Creston, Ia., Oct. 14.—The annual convention of the Corning District Dental Society at Shenandoah, closed yesterday afternoon with the election of officers for the ensuing year. L. E. Stiles, of this city, was chosen president of the association; L. W. Lewis, of Shenandoah, vice-president; F. M. Kelsay, of Villisca, treasurer; D. R. Dudley, of Mt. Ayr, secretary. Leon was chosen as the meeting place of the 1916 convention.

Iowa—Northern

Mason City, Oct. 21.—Special.—After deciding to meet at Clear Lake next year, the North Iowa Dental Association adjourned, electing the following officers for the ensuing year: President, Dr. Seerley, of Waverly; vice-president, Dr. Genung, of Osage; secretary, Dr. Clark, of Charles City; treasurer, Dr. Miller, of Charles City.

Kansas—Golden Belt

Abilene, Kans., Oct. 27.—Thirty dentists, members of the Golden Belt District Dental Society, met in their twelfth session here today. At the evening session the following officers for the coming year were elected: President, W. T. Triplett, Salina; vice-president, M. J. McKee, Manhattan; secretary, B. F. Kelley, Abilene; treasurer, J. R. Clark, Enterprise; executive council, E. L. Garpett, Abilene.

Oklahoma—Oklahoma County

Oklahoma City, Oct. 20.—At a meeting of the Oklahoma County Dental Association at the Lee-Huckins Hotel, Tuesday night, the following officers were elected for the ensuing year: A. B. Potter, president; J. R. Caughron, vice-president, and Leona M. Reynolds, secretary-treasurer.

Vermont—Rutland County

The Rutland County Dental Society held its first meeting of the season Wednesday evening, November 10th, and the following officers were elected for the ensuing year: President, Thomas Mound, Rutland; vice-president, G. L. Gutterson, Fair Haven; secretary, Grace L. Bosworth, Rutland; treasurer, Paul H. Blanchard, Rutland. Meetings are held once each month, and nearly every dentist in the county is identified with the society, thereby making them interesting and profitable.

GRACE L. BOSWORTH,
Secretary.

Pennsylvania—Shenandoah Valley

Woodstock, Oct. 12.—The fourth semi-annual convention of the Shenandoah Valley Dental Association convened in the court house this afternoon at 4:45 o'clock. Following are the officers: President, W. B. Fahrney, of Timberville; first vice-president, O. Van Deusen, of Front Royal; second vice-president, C. H. Green, of Lexington; corresponding secretary, C. E. Nicholas, of Harrisonburg; treasurer, F. W. McClure, of Lexington; executive committee, W. H. Wunder, Woodstock, chairman; George A. Sprinkle, of Staunton, and B. F. Maphis, of Strasburg.

Program committee, Dr. Wunder, chairman; George A. Sprinkle, of Staunton, and W. T. Lineweaver, of Harrisonburg.

Massachusetts—Northeastern

Springfield, Mass., Oct. 15.—Three hundred and twenty-five members were registered at the close. Hartford was chosen for the meeting next year. Following are the officers elected: President, Albert E. Carey, of Hartford; first vice-president, David Manson, of Burlington, Vt.; second vice-president, Ira B. Stilson, of Providence, R. I.; secretary, Alvin A. Hunt, of Hartford; assistant secretary, L. P. Abbee, of Hartford; treasurer, T. H. Saunders, of Westfield; librarian, W. A. Young, of Concord, N. H.; editor, Irving E. Pendleton, of Lebanon, N. H.; W. F. Andrews of this city, G. H. Banks of this city, W. J. Horrigan of Holyoke, L. Allen Carey of Hartford, Louis N. Wiley of Thompsonville, and Frank J. Erbe of Waterbury were elected new members.

N. M. H. A.

National Mouth Hygiene Association,
Department of Extension Lectures.

ANNOUNCEMENT

The Lecture Rental Service inaugurated by this department in May, 1914, has placed our first lecture, designated as lecture "A," "The Care and Use of the Human Mouth," before about half a million people, easily establishing itself as an educational factor of no small importance in connection with the present mouth hygiene campaign.

As less than fifty per cent. of the expense of maintaining the service to date has been met by rental fees and receipts from the sale of outfits, there seems to be no reason why the department should not be self-supporting, both rental and sale rawillt be es advanced November 1st as follows:

Rental charge for use of manuscript and 36 slides, one date, $2.50. (Former rate, $1.)

Additional charge for day following, $1. (Former rate, 50c.)

Retention for third and each subsequent day, 50c. (Former rate, 25c.)

Purchase price advanced from $18.85 to $25, giving purchaser full rights for personal use; giving societies rights for use by their members only.

This advance in rates will enable the department to extend the work in many needed directions and make possible the preparation of other lectures which seem to be needed for special types of audiences.

Application blanks will be furnished by the undersigned, to whom all communications relative to the service should be addressed.

EDWIN M. KENT, D.M.D.,
Director of Extension Lectures,
330 Dartmouth St., Boston, Mass.

Fraternal Greetings from Dr. C. H. Mayo

St. Paul Dispatch.—Dr. Charles H. Mayo, of Rochester, is giving assistance to "Toothbrush Week" in St. Paul, November 15 to 22. Doctor Mayo says that the next great preventive step in medicine lies with the dentists, and believes that oral hygiene education will do much toward lowering the death rate in Minnesota.

Doctor Mayo says of the local campaign: "It gives me great pleasure to send through the St. Paul Dental Society a word of greeting and of appreciation to the dentists. As one of the directors of the Research Institute of the National Association, I have become fairly familiar with the status of dentistry and its progress in America. There is no other profession that is making more rapid scientific advancement. The dentists are giving their work freely to the poor, and they have done much for preventive medicine by the inspection of school children whenever called upon.

"Minnesota, especially, is to be congratulated on the advanced position attained by the dental profession in both research and practical work, and this is very gratifying since it marks only a beginning in the great future of dentistry. The medical profession, as never before, has come to appreciate the work of the dentists. This is shown by the greater harmony, the association of work and the consultation between the two professions.

"There is great need for the establishment of free dental clinics throughout the state, and I see no reason why they should not be established in every city of 3,000 and upward. This would lead to better team work in the division of labor among physicians, to greater local harmony in the professions and would add to the appreciation of the dental profession by the public, besides being a common good.

"The dentists and the medical profession, because of the newer ideas concerning disease, must of necessity become more closely associated in their work; the dentists must have more training in medicine and the medical man must have more and better training in the rudiments of dentistry, that consultation between the two professions may lead to increased good to the community. The time is not far distant when the public, by frequent or regular visits to dentists will seek prevention rather than cure in diseases of the teeth and jaws, with far reaching consequences in general and local diseases."

Post-Graduate at Forsythe

By the opening of a Post-graduate School of Orthodontia, the Forsyth Dental Infirmary for children is fulfilling one more of its functions as conceived in its original plans, and one which was characterized by President Emeritus, Charles W. Eliot, in his address at the dedication exercises, as one of its most important influential duties, the education of the profession and the public.

While the school is not the first to be established in this important field of dentistry, it is the first to adopt a full academic year of instruction. The curriculum is comprehensive and includes not only the technical dental subjects but also all of the allied medical branches that have a bearing on the development of the child. The unsurpassed clinical facilities of the institution, which are already demonstrated, will provide the student ample opportunity to acquire the practical experience necessary. Emphasis will be laid on preventive orthodontia. The faculty includes not only local men prominent in their branches but also a large number of specialists from the East and Middle West.

Dental College in Hands of Advisory Board

At a called meeting of the Dallas County Dental Society attended by members of the faculty of the state dental college, a resolution was unanimously adopted accepting a proposition whereby the management and direction of the college is placed in the hands of an advisory board composed of Dallas members of the county society This board was named as follows:

Drs. Bush Jones, J. W. Halsell, A. L. Frew, S. L. Barron, J. R. Beachum, G. Waller Staples, J. J. Simmons and C. L. Morey.

After the meeting of the county society the advisory board went into session and elected the following officers: J. J. Simmons, president; Bush Jones, vice-president; C. L. Morey, secretary; J. W. Halsell and A. L. Frew, new members of board of directors.

The proposition to the above effect was made by members of the faculty of the State Dental College to a committee of the county society, and was generally discussed at the meeting and met with unanimous indorsement. The board will take charge of the management of the college at once.

A majority of stock in the college was also represented at the meeting.—*Dallas News*

Protecting Ignorance

Of all the problems before the corporations, the legislatures and the exchanges that of protecting foolish people against themselves is the most exasperating. As an example of how the small investor or speculator risks his money in sheer ignorance, the following question addressed to The Wall Street *Journal* is illuminating:

> "Could you give me any information regarding United Railways Investment stock? I purchased some at a low prcie and thought it would probably rise when the general advance in railroads commenced."

This question is propounded by a professional man, who could not hold his present position without the exercise of considerable intelligence. But his reason for the purchase he describes shows that he was utterly ignorant of the nature of what he bought.

He does not know that United Railway Investment stock represents, in effect, a holding company for street railways, lighting and power properties. It has nothing whatever to do with the general railroad situation, a fact of which this buyer could have assured himself by looking at its annual report before he risked his money.

In another instance, an outside speculator bought Allis - Chalmers preferred, and cleared fifteen points profit. When his friends congratulated him he said, "Yes, I knew they were good. I have driven one of their cars and am familiar with the work they turn out." He actually thought he was buying Chalmers Motors.

Now, either of these gentlemen, if their speculation had gone wrong and they had lost their money, would not have hesitated to denounce Wall Street. If the money had not been their own, but that of others held in trust, a number of highly moral newspapers would have written articles denouncing the maelstrom of speculation and the demoralizing influence of the Stock Exchange.

Of course, there is a moral duty upon every brokerage house to show its customer, where he gives the house an opportunity to do so, the exact nature of what he is buying. But there are some people who have no business in Wall Street, and the brokerage houses will find it to their advantage, in the long run, to tell them so.